

# FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 213. (No. 4, Vol. V.)

JANUARY 25, 1913.

[Registered at the G.P.O.] [Weekly, Price 3d.  
as a Newspaper. Post Free, 3½d.]

## Flight.

Editorial Office: 44, ST. MARTIN'S LANE, LONDON, W.C.

Telegrams: Truditur, Westrand, London. Telephone: Gerrard 1828.

Annual Subscription Rates, Post Free.

United Kingdom ... 15s. 6d. Abroad ... 20s. 6d.

### CONTENTS:

	PAGE
Editorial Comment:	
The Coming Budget and Aerial Defence ...	81
Sun Soarability ...	82
Men of Moment in the World of Flight: A. V. Roe ...	83
World's Records ...	84
Stability and Control. By A. E. Berriman ...	86
Brighton and Shoreham Aero Club... ..	88
Aviation in War ...	89
Royal Aero Club. Official Notices ...	90
From the British Flying Grounds... ..	91
Eddies. By "Oiseau Bleu" ...	95
Flying at Hendon ...	97
Hydro-Aeroplanes. By V. E. Johnson, M.A. ...	98
Airship News ...	99
Accessories for the Aviator ...	100
Aeronautical Engines ...	101
British Notes of the Week ...	102
Foreign Aviation News ...	102
Models. Edited by V. E. Johnson, M.A. ...	104
Correspondence ...	106

## EDITORIAL COMMENT.

### The Coming Budget and Aerial Defence.

With the first month of the year drawing rapidly to an end, the time approaches when His Majesty's Ministers must appear before Parliament and the country with a statement of their financial programme for the ensuing year. According to certain responsible forecasts which have appeared in the public prints, it seems certain that the sum which the country is to be asked to provide will exceed by a substantial margin all the records of previous Budgets—a round £200,000,000 has been named as the exact figure, this being no less than eleven millions sterling in advance of the sum budgetted for 1912-13. It is an enormous sum and may well cause thinking people to ask where all this growth of national expenditure is to end. That question, however, is one with which we in the Editorial capacity have nothing to do, at least at the moment. On the contrary, our only anxiety is to know that sufficient money is to be provided for that service with which we are most intimately concerned and which we honestly feel is vital

to the safety of the nation. By this we mean, it goes without saying, the important question of aerial armaments and the amount which the Government proposes to devote to strengthening that line of defence during the coming year.

It has been stated with some show of authority that it is proposed to devote a sum of £1,000,000 during the financial year 1913-14 to the aerial services of the country, and we are inclined to accept the statement as being at least very close to the mark. It has been made manifest during the past few months that the Government and its advisers have come to regard aviation as having passed its experimental stage and entered upon a really practical existence as a serious factor in the scheme of defence. The experience of the Army manœuvres and of the Military Trials must certainly have driven home the conviction that in aviation and a properly equipped and organised air fleet may lie all the issues between ignominious defeat and certain victory in the wars of the future. Taking all things into account, it therefore seems inevitable that the Government must spend far more than the merely experimental appropriation of the closing year, if we are to maintain our status as a first-class fighting power. Further to this, having regard to what we know to be taking place on the Continent and the progressively larger appropriations for aerial purposes which are a feature of the European war budgets—which we have recorded from time to time in the pages of FLIGHT—it would seem that the sum noted is absolutely the very *minimum* upon which even reasonable security can be achieved. We would rather it were more, much more, for it must not be lost to sight that we are not yet as favourably situated as some of our rivals in the matter of possessing a ready-made industry. That, as we have so often insisted, is one of the weak points of the situation on this side of the Channel and, if we are to keep pace with others, we must create and foster that industry in order that our sources of supply may remain assured in time of need.

Exactly what proportion of the million that is said to be about to be provided for aviation this year will be earmarked for purposes other than the purchase of machines, we have of course no means of knowing. But, it is apparent that a great deal of the spade work has already been accomplished, which should enable very efficient use now to be made of any sums that become available. It must be remembered, of course, that an aeroplane does not fly by itself and also that it is necessary

to train mechanics as well as pilots. Indeed, enough importance has hardly been made of this latter point, for there can be no question that the *safety* of flying depends almost more on the man who remains below than on the man who ascends aloft. A pilot once trained is more or less safe within the limits of his experience so far as atmospheric disturbances are concerned, and when the conditions in the air suddenly present him with a problem beyond his prior knowledge, it is necessarily very much a matter of chance as to how he will come out of it anyway. But the inexpert or careless mechanic is a factor in the situation that assumes a seriousness of an altogether different kind. A nut that is unlocked may hold in place for an hour, for a day, or for a week, but equally it may come adrift at any moment. A slack engine mounting might well have fatal consequences to the man on the machine, for it is in just such slackness that one might expect to find the full danger of that much-talked-of gyroscopic force, which in itself and as a known quantity should not otherwise seriously disturb the pilot's control. Again, the adjustment of the stay wires is in the hands of the mechanic, and it depends on his skill and carefulness whether the wing spars leave the ground truly in line from shoulder to tip or whether they are initially stressed by deflection such as might easily escape general notice.

Indeed, there are many different things to be done with the million, even if we get it, but the aerial fleet will not be a question of one million, but of several millions in a few years—and the sooner the better—not only have we to catch up other Powers in our fourth arm; we have to pass them and, as on the sea, establish ourselves as Mistress of the Air. People can say what they please, but the man who is not otherwise interested will be well advised to adopt for his watchword, "England has got to have aeroplanes all the same."

## Sun Soarability.

We have not been surprised to receive from our readers letters drawing attention to the comparison that suggests itself between Mr. Dyott's fascinating account of his experiences in Central America, published in the last issue of FLIGHT with the observations by Dr. Hankin on Bird Flight in India, which we published in a series of articles during 1911. Indeed, it would be no exaggeration to say that by eliminating the personal pronoun and substituting bird for aeroplane, much of Mr. Dyott's description might bodily be transplanted into the midst of Dr. Hankin's articles and none would be the wiser.

Mr. Dyott's account of the influence of sunshine and shadow on what Dr. Hankin would have called the soarability of the air, tallies in almost every particular with Dr. Hankin's own version of the influence of the atmosphere on the soaring flight of birds.

While we were anxious that Dr. Hankin should be afforded a free field for the discussion of his theory as to the cause of soarability, we hold no brief and in truth have small sympathy with his idea of "Ergaer." On the other hand, his powers of observation are marvellous, and we are inclined to think that personal prejudice against his conclusions may have in some measure discounted the general appreciation of the intrinsic worth

of the detail on which they were based. None realised better than Dr. Hankin himself how separate and distinct was his theory of "Ergaer" from the array of facts that he marshalled so skilfully as evidence to prove it. He presented his facts and he presented his theory; if time sees fit to retain the one and discard the other the value of his work will have lost nothing in consequence.

It has been open to all to draw their own conclusions on the same evidence as Dr. Hankin used for his own ideas, save only, of course, that Dr. Hankin had the advantage of living daily in the actual environment and of perceiving many things that may well have baffled systematic description. But while we were most anxious to present Dr. Hankin's conception of "Ergaer" for open discussion without prejudice at the time it was put forward, we must confess to having ourselves found in his articles a confirmation rather than otherwise of the soarability being due to an upward component of velocity in the air caused by the local heating effect of the sun's rays. Dr. Hankin himself, if we understood his point of view aright, considered that the magnitude of the velocity was insufficient to account for the phenomena observed, but one must bear in mind that the natural rate of fall of a soaring bird is slow, and that it does not need a very considerable upward component to satisfy the conditions of soaring flight.

Similarly in the case of aeroplanes, local disturbances affecting the upward trend of the wind may assume serious consequences of a magnitude that is not perhaps fully realised even by pilots of wide experience. Undoubtedly Mr. Dyott was flying in a region where what may be termed sun soarability was apt to assume an exaggerated value, but, influences on a smaller scale that are nevertheless similar in nature may well affect the flight of aeroplanes even in this cloud-ridden country. Such effects are more particularly likely to be pronounced in cases where the machine is overloaded or the engine is pulling below par. Differences in the vertical components of the movement of the atmosphere are also more likely to be pronounced where the flight takes place alternatively over water and over land in a country like this, for the heat of the sun would seldom be adequate to produce the phenomena locally over a region of land as is described by Mr. Dyott. Water is thus especially a region to be avoided unless the height at which one is flying will certainly suffice to carry the machine to a safe landing ground under the worst conceivable conditions. Just as it does not require very much up current to account for soaring flight of birds, so does it not require a very great down current to entrap a pilot who is flying low over the water. Moreover, there is this also to be considered, that any manœuvre such as turning, is in itself a source of loss of altitude unless there is a very wide margin of power in the engine, and the sharper the turn the greater the drop, other things being equal. Those who read Mr. Dyott's description of his flight at Puebla when he nearly got trapped on the wrong side of a row of trees merely because the sun had got behind the mountains, will better be able to realise the broad character of a certain type of atmospheric disturbance that has not as yet come fully within the general run of pilots' experiences.

## Regulations for Meetings in France.

CONSEQUENT upon the accident which occurred at Gray last September, the French Minister of the Interior has issued a series of regulations governing the conduct of flying meetings. In future a permit will have to be obtained from the local authorities, and application for this must be made at least a month in advance of the date of the meeting. The promoter must also see that those who will be taking part have not only a pilot's certificate, but also a

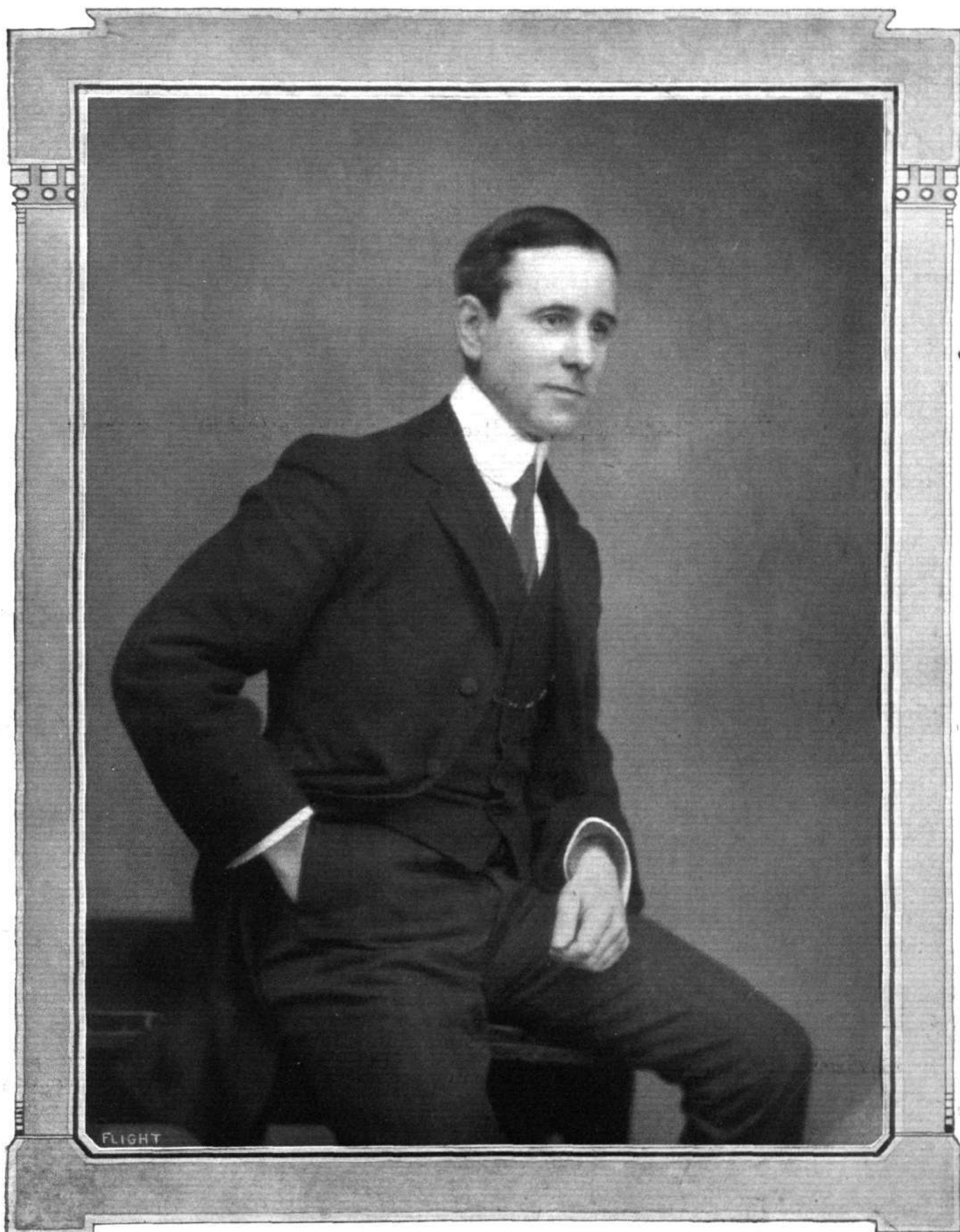
licence from the Aero Club of France. Flying grounds must allow of a course being laid out at least 100 metres wide, and not less than 1,500 metres round. The enclosed area of the course in square metres must be at least equal to a figure obtained by multiplying the length of the course by 25. Round the course there must be a limit band 30 metres wide over which the aeroplanes must not pass. The ground constituting the course must be of such nature that a motor car can be driven all over it.



JANUARY 25, 1913.

**FLIGHT**

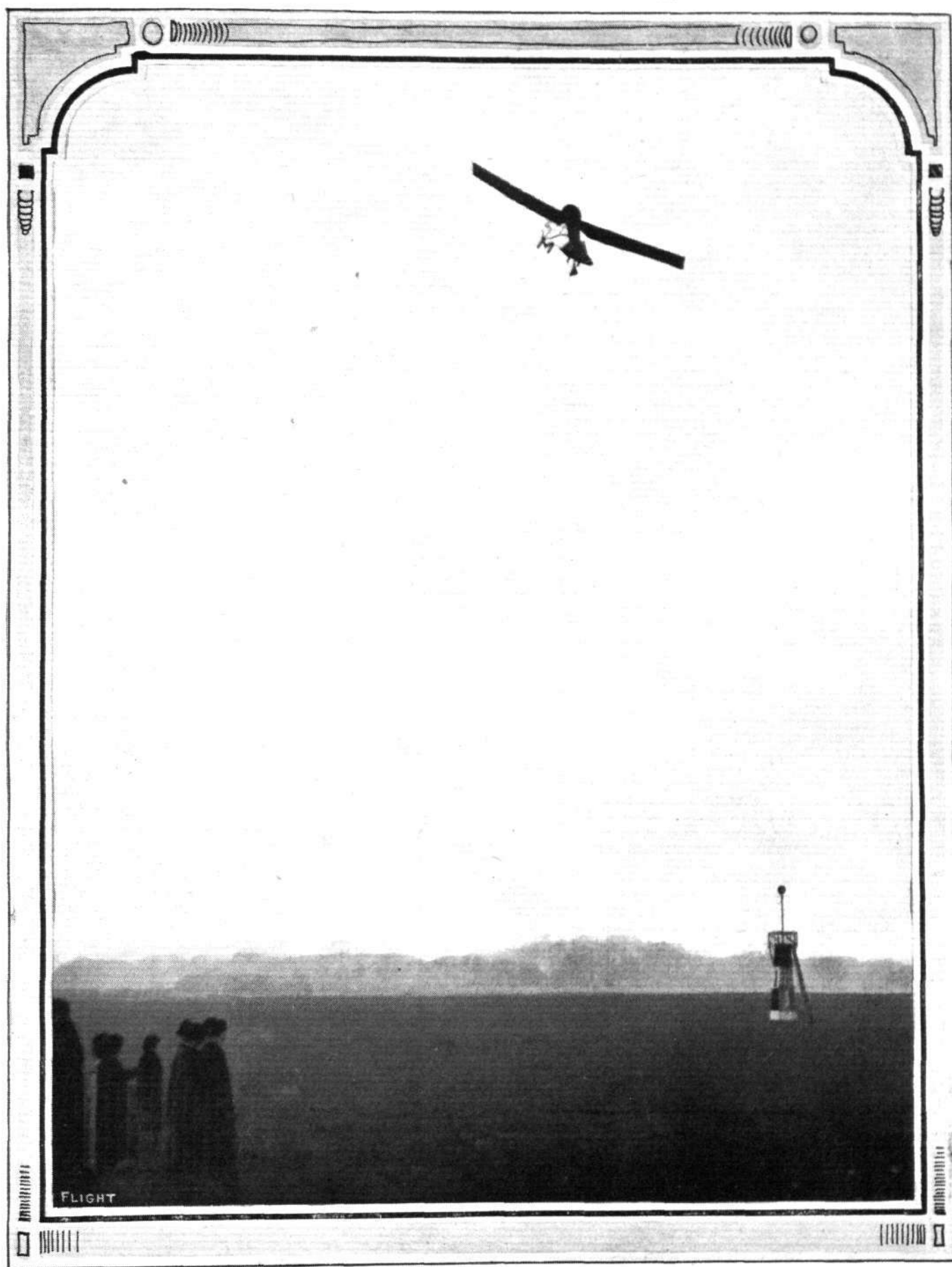
**MEN OF MOMENT IN THE WORLD OF FLIGHT.**  
**Pioneer Pilot-Constructors.**



MR. A. V. ROE.







MR. BLACKBURN FLYING THE BLACKBURN MONOPLANE AT HENDON.—A curious optical illusion is produced, it being difficult, without knowledge, to say whether the machine is travelling towards or away from the spectator.

# SOME THOUGHTS ON STABILITY AND CONTROL.

By A. E. BERRIMAN.

(Continued from page 63.)

## III. Neutral Tips and the Negative Warp. The Pioneer Work of Dunne, Weiss and others. Dr. Hankin's Observations on Steering in the Soaring Flight of Birds

The subject as thus far discussed has been mainly related to steering, which aspect of the situation I regard as fundamentally the most important, partly for the reason that aeroplanes must be built to be steered, and partly because the assumption of a machine being canted necessarily supposes also that a steering movement has, whether intentionally or otherwise, been initiated thereby.

Practical considerations of the use to which aeroplanes might be put renders it out of the question to suppose that they should never be canted accidentally. An internal displacement of the load by a movement of one of the occupants would, of course, tend to upset the balance of a machine that in itself might be stable against veering winds.

Thus, the situation, it seems to me, resolves itself far more into a question of safe control than of permanent inherent stability on straight-line flight. Permanent negative down pressure wing tips potentially afford such stability. The warping of such tips so as to differentiate their negative angles as in the Dunne aeroplane tends to give rise to reactions that are in the proper sense for initiating a bank and the general tendency of the negative tips themselves is towards stability. The problem, in detail, however, is complicated by the difference in mean speeds on the part of the positive portions of the two wings, which also, it would seem, ought properly to be warped. But, as was pointed out in the first part of this article, there is also the centrifugal couple tending to destroy the bank. From general considerations in this connection, especial interest would appear to attach to the angle of  $45^\circ$ , which also has particular importance from the point of view of power required, as has already been explained.

When the subject at large is regarded from a broad standpoint, and due consideration is given to the fact that the pilot must always be an essential part of the machine, it would appear that an aeroplane not permanently stable, but nevertheless fitted with a safe control, might well be the best combination for practical purposes. Thus, if a machine with normally neutral wing tips were fitted with a control that would enable the pilot to warp them negatively at will, it seems to me that the combination of safety with efficiency tends to reach its highest limit in such a system. In any case, adequate power must be provided on the machine which, if necessary, must be capable of supporting itself with both tips fully negative to the extent required for stability in straight-line flight.

Having presented to the best of my ability my own argument in respect to lateral and directional stability, I desire, before passing on to discuss longitudinal stability, to make reference to the work of others. Whether what I have put forward proves to be true in practice or not, the present discussion thereof affords an excellent opportunity of drawing attention to various matters that seem to be significant on the light of it.

First and foremost there is, of course, the work of Lieut. J. W. Dunne who spent years experimenting with all sorts of models until he at length evolved his present machine with negative wing tips and retreated wings. I had always supposed, however, that the significance of the negative tips was related to their position on the retreated wings and not something that might equally well be applied to straight wings such as are used on most modern machines. The possible shielding effect of the down-turned weather tip, coupled with the tendency to a positive angle on the part of the lee-tip of a retreated wing in an oblique wind, suggested that the general tendency of the system was towards conferring what I then had occasion to describe as "stiff" stability in order to distinguish it from the rolling stability of the dihedral, which implies the power to recover balance.

It is naturally very interesting to read at the present time what Mr. Dunne had to say on the subject of stability so long ago as 1909 in his patent No. 8,118 of that year. Thus: "In order to render the machine free from oscillation, it is advisable that as the wing extends outwards the angle of incidence should decrease gradually so that there may be no abrupt alteration of angle at any part of the wing. With a wing so formed, alterations of the mean angle of incidence bring into play gradual alterations in the pressures on the wings gently to correct the deviation from normal conditions. It is of the greatest importance that this correction should be gentle at the commencement of an oscillation, and it is equally important that the tendency should persist through wide ranges of variation in the mean angle of incidence and increase as the departure from the normal condition increases. This latter condition requires that the difference between the angles of incidence of the inner and outer portions of the wing should be considerable, a condition

which in turn requires in general a negative angle of incidence at the tips under normal flight conditions.

"I have found that twisting the wings or rendering them flexible so that they twist under air pressure, to cause the tips to present the requisite small angle, involves the disadvantage that sections taken fore and aft across the tips of the wings or from the inner portion to the tip gives curves more or less concave on their upper side, thus greatly detracting from the lifting powers of the wing. A twisted wing, therefore, is unable to give large pressure reaction when driven at an angle against the air . . . .

"In order to obtain the correct form, therefore, it is necessary to consider :

"Firstly, how the angle of the fore and aft section can be made gradually to decrease as the wing is built outwards without producing points of inflection in the surfaces ; and

"Secondly, how considerable differences in the angles of the inner and outer portions can be maintained without too much loss of pressure under the outer portions and, therefore, loss of lifting power . . . .

"For the guidance of all machines constructed in accordance with this specification, I consider that the control described in the patent specification No. 1,469 of May 21st, 1870, which comprise horizontally pivoted flaps at the rear tips of the wings, is particularly suitable. . . . If with such flaps it is desired to incline the front of the machine upward, the flaps would be inclined upwards so as to receive air pressure upon their upper surfaces and so force the rear of the machine down. To incline the front of the machine downward the flaps would be lowered so as to receive air pressures on their under sides and so lift the rear of the machine. In order to turn to the right, the right-hand flap would be raised and the left-hand flap lowered, and in order to turn to the left the left-hand flap would be raised, and the right-hand flap lowered . . . .

"I have found by practical experiment that machines, as described, supported mainly by wings of which the whole or the outer portion are inclined backward and constitute portions of the surfaces of cones or cylinders, fully satisfy the conditions of stable and steady flight."

A later patent, No. 11,021, of 1909, relates more particularly to the features necessary in biplane as distinct from monoplane design, thus :—

"In order to obtain the same degree of stability when the principles embodied in the monoplanes above indicated are applied to biplanes, I have found that the tips of the upper wings should be inclined downwards and forwards in relation to the tips of the lower wings.

"While the angle of incidence of the upper wing should decrease towards the tip and preferably become negative as before, the lower wings may have a uniform angle of incidence or even one increasing slightly towards the tips ; if such increase exceed a comparatively moderate extent, however, the stability of the aeroplane will suffer. But, I consider it preferable, and the best results are obtained, when both pairs of wings are so constructed that while their inner portions have a positive angle of incidence, their tips have a much smaller or actually negative angle of incidence, the variation being greater in the upper than in the lower pair of wings, and the superposed wings being so set relatively to each other that the tips of the upper pair are inclined forward and downward in relation to those of the lower pair.

"With the machine described, steering in either a horizontal or vertical plane may be effected by the ailerons or flaps arranged, as described, behind the tips of the upper wings. . . .

"The action of these ailerons may be best understood by the consideration that raising one of them, besides decreasing the angle of incidence of the tip of that side, also increases the existing difference the angles of incidence of the tips of the upper and lower planes, and therefore for a double reason increases the resistance of that side of the machine. On the other hand, when one of the flaps is lowered, the angle of incidence of the tip on that side is rendered more positive, while the difference between the angles of incidence of the tips of the two wings is decreased, thereby for both reasons decreasing the resistance of that side of the machine."

Although from the patent descriptions it might not seem perhaps as if the actual down pressure on the wing tips was sufficiently emphasised as an essential condition of stability, nevertheless, from the known behaviour of the machine in flight and the details of its construction, it seems to me that in fact the wing tips of the Dunne aeroplane must have been definitely negative (down pressure) from the first. Moreover, it is quite conceivable that the negative tip as such may give trouble, unless obtained by the gradual change of angle that is



the feature most emphasized in the Dunne patent. Those who may be interested to try the principle would thus be well advised to take stock of what Mr. Dunne has to say on the subject, for to Mr. Dunne belongs the credit of having developed the principle, not in thought only, nor in models only, but in actual full-sized machines; and to the best of my knowledge he is the first to employ definitely down-pressure wing tips in aeroplane construction. That the principle does in fact break down the need for the rudder is shown by the fact that the Dunne aeroplanes have no such organ; moreover, they are capable of steering closed circuits with fixed controls.

In the steering of his machine, it will be observed that Mr. Dunne differentiates the permanently negative tips, both tips remaining negative after the warp. In modern systems of control, one wing tip at least is positive after the warp. The value of the negative angle for steering has also been recognised by Mr. H. S. Wildeblood, Superintending Engineer, Indian Public Works Department, of Mount Abu, Rajputana, who filed a patent, No. 6,642, of 1910, containing the following claim: "Balancing planes, which lie normally in the direction of flight, and in such a position that their efficiency will not appreciably be interfered with by the main planes, worked independently, and so that their angle of incidence is always below and never above the direction of flight."

Mr. Wildeblood's patents are the outcome of some exceedingly interesting experiments at Rajputana, which he described in *FLIGHT* of June 24th, 1911. In the main this work relates to the balancing qualities of flexible trailing tips, which have an interest of their own as a principle related to the recovery of balance rather than to inherent absolute stability. It is, however, interesting to quote the following sentence that occurs as an incidental remark towards the end of the article: "A slight initial dip to both the balancing planes increases the automatic stability."

In connection with the subject of stability generally, nothing is of greater interest, I think, than the observations that have been made in different parts of the world on bird flight. Not all of the observers were qualified for their work, but I think it will be agreed that the observations of Dr. Hankin, at Agra, certainly rank with those of Macey and Lilienthal as a record of first-class importance. At the moment there is only space to refer to his remarks on steering during soaring flight. (*FLIGHT*, p. 739, August 26th, 1911.)

"I first obtained a clue to the nature of steering movements by observing the flights of the black vulture . . . Occasionally the tip of one wing will be seen to be depressed downwards momentarily and then raised at once to its original position . . . After the movement there is almost time to formulate in words which way the bird is going to turn before the commencement of the turn can be recognised. In my notes I originally described this movement as a dipping downwards of the wing tip. This phrase was soon abbreviated to dip, by which term I propose to refer to the movement in future.

"It is necessary to consider how the dip is brought about. The first possibility that suggested itself to me was that it was caused by some intrinsic muscles of the wing. But on examining the wing of a dead bird, it appeared to me that the range of possible movement at the carpal-joint was less than my observations had led me to expect. It then occurred to me that perhaps what really happened was that the whole of the wing was rotated until the air pressed on its upper surface instead of on its under surface . . . In order to decide between these two possibilities I dissected the wing of a black vulture and found that neither of the above suggested explanations is an adequate statement of the facts of the case.

"None of the intrinsic muscles of the wing have any power of making a dip movement by any direct action. But, on the other side of the ulna, I found three muscles that have the power of rotating the front edge of the outer part of the wing. Supposing the wing is extended horizontally, then if these three muscles come into action, the front edge of the wing tip becomes depressed. That is to say, the wing tip is rotated round the axis of the wing. The rotation is in such a direction that the air ceases to press on the underside of the wing tip feathers. Instead, it presses or tends to press on their upper surfaces. Hence the tips of these feathers are bent downwards, producing the appearance of the dip movement. From the dorsal aspect of the wing, two muscles may be seen that have the power of rotating the front edge of the wing tip in the opposite direction. These muscles come into action to return the wing tip to its original position. I have also found these muscles in the wings of the common vulture, the adjutant, and the sarus."

It seemed to me, when I first read this remark, that the dip was a temporary movement of a kind permanently represented in the wing of a Dunne aeroplane, and when Dr. Hankin read his paper on soaring flight before the Aeronautical Society, Mr. Dunne during the discussion himself referred to the subject (*Aeronautical Journal*, 1912, p. 39): "If the bird is rolling down its wing tips in the way that Dr. Hankin points out, and which I suppose most of you know is in my own particular machine, there is undoubtedly something in that. If I was to use a vertical tail in my machine I

should upset it altogether, because the outer part of the wing is travelling at a much faster rate on turning than the inner part, and as that is the part that is connected with the angle of incidence it would tend to press that wing down rather than to raise it. It is a matter of nicety how you get your balance."

It would appear that the natural state of the extremities of a bird's wing is not one in which they have a permanently negative angle. In general the camber seems to be washed out, and under particular circumstances the wing tip may apparently flex upwards by local pressure. From these considerations it seems to me probable that Nature's design has succeeded in combining efficiency with security. Under ordinary conditions of flight in fine weather, the safeguard afforded by the permanently negative tip would be unnecessary, and, therefore, merely a handicap to one thoroughly accustomed to the ways of the air and dependent on self-exertion for propulsion. For instance, birds that pursue flapping flight could more often make use of a highly efficient wing than a wing that is dead stable. The flexible tip, it would seem, may automatically come into action as a virtual fin to make the recovery from side-slip more sensitive.

On the other hand, birds that habitually soar in high winds and travel long distances from the land might have occasion to appreciate the absolute security of negative tips, which they can apply to their wings at will by the muscular action described by Dr. Hankin. Moreover, the inefficiency is a matter of less concern to the bird if the wind is doing the work.

Other practical work that has always seemed to have an especial interest, is that of Weiss, Handley Page, Etrich and those who have sought stability in special wing forms embodying an up-turned tip as a characteristic feature in common.

The natural balance of the Weiss models was remarkable, as I was able to see from a demonstration that Mr. Weiss very courteously made for me some years ago. Gordon England, too, who ventured to pilot the first Weiss man-carrier without engine and, as I understand, without controls, has often told me of personal experiences that make it essential to believe in the presence of some especial virtue in its design.

It appears to me of importance first to know, however, whether the up-turned wing tips on the above-mentioned machines are or are not normally causing a down pressure on the wing. The fact of them appearing to be negative does not necessarily imply more than a "wash-out." When warped, it seems especially likely that one of the tips may become positive.

In any case, the deciding factor is the use of the rudder to promote a bank, and in this connection some notes on his experiences as a pilot by the late Lieut. Parke definitely record the automatic banking of the Handley Page machine when steered with the rudder alone. Whether, therefore, the tip pressure is normally zero or downwards on the wing, the fact remains that its magnitude does not neutralise the increasing lift of the positive part of the wing in a relative spin.

Much light was also thrown on the subject of up-turned wing tips, dihedral angles and the like, by Mr. E. H. Harper when he gave his synopsis of Prof. Bryan's mathematical treatment of stability as a paper to the Aeronautical Society recently. Up-turned wing tips in this case primarily relate to the extremities as a whole being up-turned, the up-turned portion being parallel with the line of flight.

According to that theory, all such modifications of straight wings project virtual fins on the plane of symmetry, and may be regarded as such. The fin of the up-turned portion is projected in a position at right angles to the plane of the up-turned surface so that if the wings are retreated the effect is to throw the virtual fin forwards. A retreated wing with up-turned tips, therefore, projects a virtual fin somewhere above and ahead of the propeller.

Together with a tail fin, such as a neutral rudder, this elevated and forward position of the balancing fin constitutes, so I understood from Mr. Harper, the best combination for *still air* stability that he and Prof. Bryan have as yet investigated. Their work on this particular case being unfinished, there is no reference to it in Prof. Bryan's book.

The foregoing theory, unless I misunderstand it, supposes the up-turned tip either to be contributing to the support of the system or to be neutral. The first to investigate by the same process the consequences of making this balancing tip a down-pressure surface is Mr. Hume-Rothery, whose entirely independent yet coincident investigation arrives at the same conclusions as those obtained from my own different line of thought. The much greater importance of Mr. Hume-Rothery's work is, of course, that it puts the matter on a quantitative basis, and so enables designers to study the subject from a numerical standpoint.

Mr. Hume-Rothery's definition of a "partial horizontal gust" appears in effect to be the same as my own treatment of a horizontal gust as a "sudden angular acceleration of the wind producing relative spin."

(To be continued.)



## BRIGHTON-SHOREHAM AERO CLUB DINNER.

QUITE a cheery party assembled at Mr. Harry Preston's popular hotel at Brighton—the "Royal York"—on Saturday evening last, to celebrate the completion of the Brighton-Shoreham Aero Club's successful first year of working, and to provide a hearty send-off to its second. Over fifty guests sat down to an excellent repast, such as the management of the "Royal York" always know how to provide. The chairman of the evening was Mr. Thomas Blair, who took the place of Viscount Curzon, the president of the B.-S. Aero Club. The latter had, unfortunately, to be absent, by reason of political duties. General Arbuthnot, C.B., was also unable to be present, as he had suffered injury in a taxi-cab accident; Colonel Massy was present in his stead. Other notable guests were Sir Theodore and Lady Angier, Mr. Roger Wallace, K.C., and the Mayor and Mayoress of Hove.

After the loyal toasts had been given by the Chairman, the toast of "The Navy, Army, and Reserve Forces" was proposed by Sir Theodore V. Angier, in a stirring little speech, in which he drew attention most forcefully to the state in which the country found itself at the present time, and expressed the opinion that our forces were too much subservient to our system of party politics.

Col. Massy responded in just the manner that would naturally be expected of one who is such an enthusiast for aviation—and an Irishman withal. In a neatly turned speech he pointed out that, in view of the fact that Germany possessed airships that were capable of maintaining flight for 1,000 miles, carrying a crew of 21 men, it behoved our Government to adequately tackle the matter of aerial defence at once. He drew attention to the quantity of explosives these German craft could carry.

Col. Massy then referred to the efforts of the Aerial League to carry to a successful conclusion their Million Shilling Fund. Of the Mayors who had promised to help, he said, the Mayor of Hove was one, and besides he had sent a considerable contribution towards the fund.

Mr. Roger Wallace, the former chairman of the Royal Aero Club, agreed that the cause of aviation in this country would receive a great impetus if men and women would only take to heart how necessary it was as a part of our system of national defence. Men were giving their lives to the cause of the science, and making great sacrifices on behalf of their country's welfare.

Mr. Daniel Hill, congratulating the Brighton-Shoreham Aero Club on the good work they had done during their first year, raised his glass to the prosperity of the Club.

Mr. G. Arthur Wingfield, the Chairman of the Club Committee, responded. He paid a tribute to the hard work put in by Mr. Henry Gonne, the Club's indefatigable Secretary. It was due largely to his efforts that the Club had made the good progress it had. Despite the bad weather of the past year they had enrolled

200 members, and as a member has the right of conferring on two friends all the rights of membership, the club's roll might be said to consist of 600 members. They had now a club pavilion on the ground, and tennis courts and a croquet lawn were being prepared. Further they had assisted Messrs. A. V. Roe and Co. in establishing a flying school at their aerodrome, and with the pupils that were enrolled there was little doubt of a great deal of flying being done during 1913.

Twelve first-class aviators had visited the club grounds, but as their movements were so uncertain it was unfortunate that nothing of the nature of a competition could have been arranged. He spoke of the attitude of the Government towards aviation. He thought that the slowness of advancement of aviation in this country was more due to the lack of interest among the people than to the authorities. Look, he said, at the initiative of the people of Germany, France, and Italy, who had subscribed hundreds of thousands of pounds to be devoted towards the establishment of thorough systems of aerial defence. Even little Italy had raised £200,000. And where were we in England? Hopelessly behind, in our usual apathetic state. Apathy, he said, is one of the most infectious diseases. They had formed the club to help cure that disease, and had had to offer unusual benefits to members to induce them to join. Mr. Wingfield mentioned that he had been told by an official of the War Office, and he hoped he was not divulging an official secret, that he regarded the club ground, from the point of view of coast defence, as the best yet existent in Britain. He had pleasure in stating that H.M. Secretary of State had executed an agreement under which the War Office have agreed to pay for the use of the aerodrome.

Paying a tribute to the young heroes of the air, he expressed the thanks of the committee to the eminent gentlemen who had consented to act as president and vice-presidents of the club, to the officials for the excellent manner in which the business of the year had been conducted, and to Mr. Harry Preston for his help in the organisation of the dinner.

"The Visitors" was proposed by the Mayor of Hove and responded to by Mrs. W. M. Murison in a humorous speech.

Mr. Roger Wallace, K.C., proposed "The Chairman" in a few words, and the proceedings came to a close. A suggestion was made afterwards, backed by Col. Massy, that the club should send a telegram to Lord Northcliffe, the proprietor of the *Daily Mail* and other newspapers of equal importance, thanking him for the services and support he had rendered to aviation, and expressing a hope that he would, in the near future, through his influential newspaper organisation, promote a national fund to be devoted towards the provision of an adequate British air force. The telegram was forwarded by the club secretary with general approval.



## QUESTIONS IN PARLIAMENT.

IN the House of Commons on the 14th inst., Mr. Joynson-Hicks asked the Secretary of State for War whether, in view of the fact that an aeroplane flown by one pilot may be slightly damaged in landing, so that it collapses when flown by another pilot, it is advisable that officers of the Royal Flying Corps, other than those at the Central Flying School, should, in turn, fly one and the same machine; and whether he will consider the desirability of arranging that each officer shall have a machine allotted specially to him, for the welfare of which he alone is responsible.

Col. Seely replied: It is the general custom in the corps for an officer to fly the same machine, but it is not considered advisable to issue any hard and fast rule on the subject.

Mr. Joynson-Hicks also asked how many officers of the corps who are classed as "trained military aviators," have had no opportunities of practising during the past six weeks, owing to the fact that the machines belonging to the military wing have been in use for the purpose of training officers recently appointed to the corps; and whether a number of these recently appointed officers have been appointed without having passed their course at the Central Flying School.

Col. Seely: The answer to the first part of the question is, None. With regard to the second part, no officers have been recently appointed to the military wing without having graduated at the Central Flying School, but a number of officers who have been selected for the Royal Flying Corps, and on probation, are doing their course with the military wing instead of at the Central Flying School. These officers will go to the Central Flying School in order to graduate, and will not be appointed finally until they have so graduated. This has been done in order to obtain the number of trained officers we require as expeditiously as possible.

## STABILITY DEVICES.

ON Wednesday evening next, January 29th, Mr. Mervyn O'Gorman will read a paper on Stability Devices before the Aeronautical Society. The meeting will be held at the Royal United Service Institution at 8.30 p.m.

The following is a synopsis of the paper:—

1. Devices for safety, for maintenance of path, and for steadiness of view platform.
2. The shape of streams in eddying air; the size of gusts; the neglect of vertical gusts.
3. The upper and lower limits of safe speed devices for maintaining the safe speed: the Wright, the Doutre, the Vee, the Stype aeroplanes, speed constancy assisted by screw propulsion, the safety of multiblade propellers, speed maintained by engine control.
4. The symmetrical aeroplane: Hulbert's device; Gregory's device to balance wing resistances in spite of warping the flaps; the work of giving rotational acceleration to the aeroplane.
5. Devices for maintaining horizontality: lowering the centre of gravity, pendulum devices; the pendulum bob restrained by a mimic of the thrust force and of the drag; pendula for warping; Gawlett's device; Schmitt's device.
6. Horizontality while changing course and Dulier's observations on certain pigeons. Horizontality sought by equalising wing pressures, springy wing ribs, Ramel and Bille's device, cross connecting the warps. Equalised wing pressures render the dihedral angle ineffective. Devices to cancel the disturbances due to horizontal side gusts usually aggravate the effect of side slips.
7. Gyroscopes.
8. Fins.
9. General devices.

## AVIATION IN WAR.

WE have received from Messrs. Farman Frères the following interesting account of flights and reconnaissances, which was sent them by an aviator serving in the Greek army, at the Balkan theatre of war. The account covers a period of twenty days.

It has often been said that aviation, in the Balkan War, has not given all the results that were expected of it. And this is in some manner true, for the Balkan States had made little preparation. They had no spare parts, few experienced pilots, and no organisation. However that may be true for the general run of aeroplanes out there, it is far from being the case with their Farman machines, which, in spite of what has been said above regarding the lack of preparation of the Balkan States, have rendered the greatest service.

Even quite inexperienced pilots have been able to use them, and to report to their Commander-in-Chief observations of value. Their construction is such that in spite of the extremely rough ground where they had to operate, flights and landings were able to be made with very little breakage. We are of opinion that perhaps the best way to convey an idea of the services these machines have rendered to the Greek Government, is to relate the day-to-day flights made by Henry and Maurice Farman biplanes. This simple diary will be more eloquent than the more or less highly-coloured accounts that have been sent from the scene of hostilities.

This short diary simply concerns the period from December 10th to January 1st.

### In Macedonia.

There were seven Henry Farman biplanes in Macedonia—six with 50-h.p. Gnome motors and one fitted with an 80. Three of them remained unused for there were no pilots to fly them. The principal flights during this campaign were:—

Lieut. Camberos, on the 80-h.p. Gnome-Henry Farman, made a reconnaissance from Larissa to Cosani, about 85 kiloms., at a height of 1,600 metres, reporting information of the greatest value.

Lieuts. Moutoussis and Notaras together made a scouting flight of more than 140 kiloms., on a 50 Gnome-Henry Farman biplane, at an altitude of between 1,100 and 1,200 metres, flying above opposing troops whose position they were able to reveal. In making short scouting flights two 50-Gnome biplanes were slightly damaged by landing on very bad ground, but repairs were effected easily.

Lieut. Moutoussis on a 70-h.p. Maurice Farman biplane, flew above Salonica at a height of between 1,200 and 1,500 metres. That machine was ordered to be dismantled, and sent to the Epirus.

### In Epirus.

The central aviation camp in Epirus was on the Plain of Nicopolis, 6 kiloms. from Preveza. The Chief of the flying squad was Capt. Bares, a French military pilot, having under him two Greek Lieut. pilots, Camberos and Notaras, who went through their tuition in France at the Farman school. On December 10th, Capt. Bares and Lieut. Camberos tested the Farman biplane that had been

assembled and made flights above Preveza. The following day, the 11th, Notaras flew over Preveza, and in the afternoon Camberos left with a passenger for Philippas, 47 kiloms. from Preveza, and afforded interesting observations. On the 14th, Camberos was transferred to the Artillery, and on the following day Lieut. Moutoussis arrived. Two days later he tested the Maurice Farman biplane that had been erected in the meantime, and flew over Preveza. The next day at 1 p.m. Moutoussis left to make a flight above Janina and landed at Amin Aga Han, 75 kiloms. from Preveza. The distance between Preveza and Janina was 106 kiloms. During this flight, flying at over 1,600 metres, he threw down bombs, creating a veritable panic amongst the Turkish troops. Many hostile bullets tore the fabric, but the machine continued its flight unaffected.

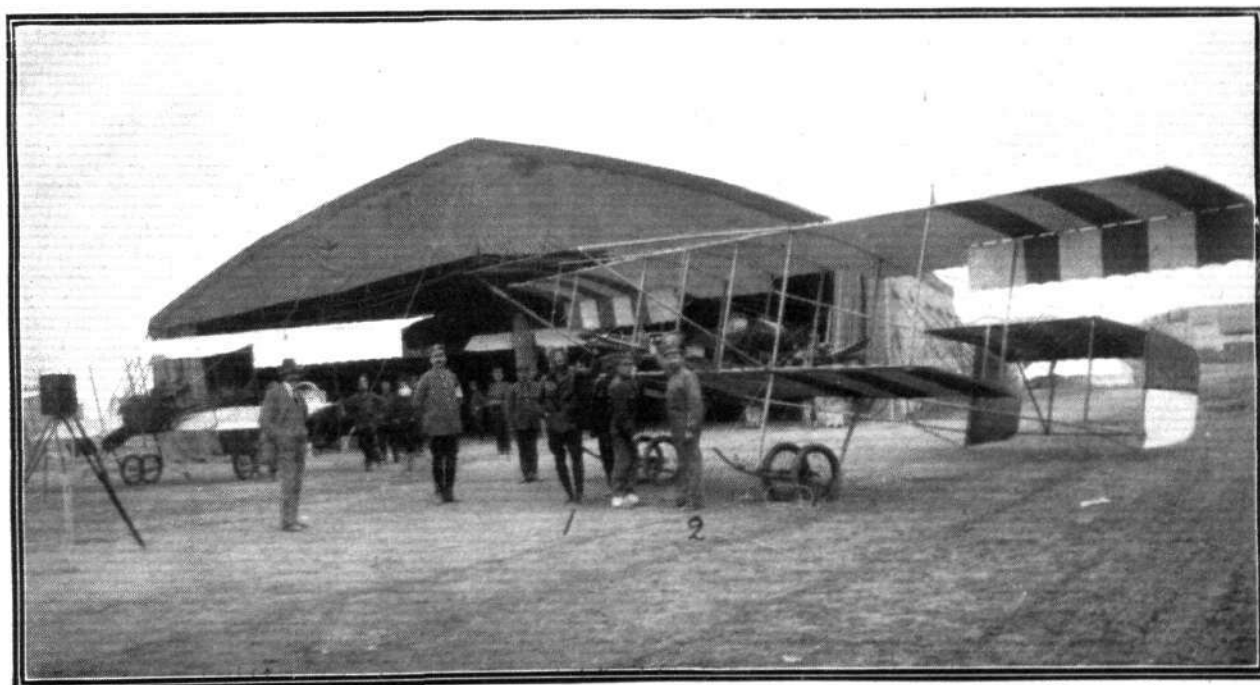
Capt. Bares, on the return of Lieut. Moutoussis, used the same machine, and flew back over Janina, 2,300 metres up. Again several bullets pierced the fabric, but the machine returned to camp unaffected, except for a slight break that happened in landing on rough ground. That same day a new Maurice Farman biplane arrived, and erection was immediately proceeded with. On the 20th, Moutoussis flew over Preveza on the Maurice Farman, and made interesting reports. He continued his flights the next day. He made a second reconnaissance over Janina on a Maurice Farman on the 22nd inst., flying over the town at 2,100 metres, and throwing bombs, which, as on the previous occasion, had considerable effect. Several hostile bullets reached him, breaking a longeron, but without affecting the machine's flying qualities. He landed at Philippas. Next day he left that town for Nicopolis. On the 24th, Notaras made flights with a passenger above Preveza. Between then and the 27th, when a new machine arrived and was erected, the two lieutenants continued their scouting flights on their respective Farman biplanes. A Greek army pilot officer, Adamides, joined the corps on the 28th. A very excellent reconnaissance flight was made by Lieut. Notaras above the fort of Bisani and the town of Janina on New Year's Day. He flew at about 2,300 metres. Leaving the aerodrome at Nicopolis at 10.20 a.m., he returned at 12.18, reporting observations concerning the garrison and the fortifications, which were considered of the highest importance by the Greek commanding officer.

During this campaign of twenty days only three machines suffered damage, and what damage was done was easily repaired.



### Flying in Morocco.

PARTICULARS are just at hand of two fine flights made in Morocco at Christmas time. On December 25th, Sergt. Feierstein went on his Blériot from Casablanca to Bou-Zuika and back, a distance of 140 kiloms., while on the following day, in obedience to orders, he took Lieut. Van den Vaero from Casablanca to Mogador, a non-stop flight of 350 kiloms. in three hours.



WAR AEROPLANES IN GREECE.—The above photograph has been received from M. Kimon Stratigopoulos (No. 2 in photo), who is at present under flying orders with Lieut. Moutoussis (No. 1 in photo).



# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## Annual General Meeting.

The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Wednesday, March 19th, 1913, at 4 o'clock, at 166, Piccadilly, London, W.

Notices of motion for the Annual General Meeting must be received by the Secretary not less than twenty-one days before the meeting, and must be signed by at least five members. Wednesday, February 26th, 1913, is the last day for the receipt of notices of motion.

## Committee.

In accordance with the rules, the Committee shall consist of eighteen members. Members are elected to serve for two years, half the Committee retiring annually. Retiring members are eligible for re-election.

The retiring members of the committee are :—

Griffith Brewer.	Prof. A. K. Huntington.
Capt. Bertram Dickson, R.F.A.	F. K. McClean.
John D. Dunville.	Alec Ogilvie.
Col. H. C. L. Holden, C.B., F.R.S.	Mervyn O'Gorman. C. F. Pollock.

Any two members of the Club can nominate a member to serve on the Committee, having previously obtained such member's consent. The name of such member so nominated, with the names of his proposer and seconder, must be sent to the Secretary in writing not less than fourteen days before the Annual General Meeting. Wednesday, March 5th, is the last day for the receipt of nominations.

Members are reminded that a ballot paper for the election of nine candidates to seats on the Committee of the Club will be forwarded to them at least seven days before the date of the Annual General Meeting.

## Committee Meeting.

A meeting of the Committee was held on Tuesday, the 21st inst., when there were present : Mr. R. W. Wallace, K.C., in the Chair, Mr. Griffith Brewer, Mr. G. B. Cockburn, Col. H. C. L. Holden, C.B., F.R.S., Prof. A. K. Huntington, Mr. Alec Ogilvie, Mr. Mervyn O'Gorman, Mr. C. F. Pollock, Com. C. R. Samson, R.N., Mr. A. Mortimer Singer, and the Secretary.

**New Members.**—The following new members were elected :—A. Tindal Atkinson, Lieut. Claude R. Cleaver, Capt. Ernest Edwards, D. E. Garnett, Capt. A. M. Macdonell, and Lieut. M. W. Noel.

**Aviators' Certificates.**—The following Aviators' Certificates were granted :—

393. Sidney T. Freeman (Engine Room Artificer, R.N.) (Short Biplane, Royal Naval Aviation School, Eastchurch).
394. Bernard John William Brady (Leading Seaman, R.N.) (Short Biplane, Central Flying School, Upavon).
395. Arthur John Bateman (Leading Seaman, R.N.) (Avro Biplane, Central Flying School, Upavon).
397. Lieut. Frederick William Bowhill, R.N.R. (Bristol Biplane, Bristol School, Salisbury Plain).
398. Lieut. A. C. G. Brown, R.N. (Bristol Biplane, Eastbourne Aviation School, Eastbourne).
399. Lieut. Alexander Shekleton (Royal Munster Fusiliers) (Bristol Biplane, Bristol School, Brooklands).
400. Capt. Gilbert Braithwaite Rickards (late Royal Munster Fusiliers) (Bristol Biplane, Bristol School, Brooklands).
401. Henry Elliot William Macandrew (Farman Biplane, Ducrocq School, Brooklands).
402. Assistant-Paymaster John Henry Lidderdale, R.N. (Maurice Farman Biplane, Central Flying School, Upavon).
403. Sub-Lieut. Reginald Lennox George Marix, R.N.V.R. (Bristol Biplane, Bristol School, Salisbury Plain).
404. Lieut. H. D. Vernon, R.N. (Bristol Biplane, Bristol School, Salisbury Plain).
406. A. L. Russell (Caudron Biplane, Ewen School, Hendon).
407. E. R. Whitehouse (Deperdussin Monoplane, Deperdussin School, Hendon).
408. Lieut. J. T. Babington, R.N. (Short Biplane, Royal Naval Aviation School, Eastchurch).

Letter from the Aero Club de France asking the Club to give its sanction to the issuing of Aviators' Certificates to Mr. W. M.

Macneill, Lieut. J. E. G. Burroughs, Mr. H. C. Fuller, Lieut. E. G. Harvey and Mr. E. Masterman, was read and the necessary permission granted.

**Airship Pilot Certificate.**—The following Airship Pilot Certificate was granted :—

15. Capt. The Hon. Claud Brabazon.

**Public Safety and Accidents Investigation Committee.**—On the motion of Col. H. C. L. Holden, seconded by Mr. A. Mortimer Singer, the following report of the Accidents Investigation Committee was unanimously adopted :—

**REPORT ON THE FATAL ACCIDENT TO MR. EDWARD PETRE, WHEN FLYING AT MARKE-BY-THE-SEA, ON TUESDAY, DECEMBER 24TH, 1912, AT ABOUT 12.15 P.M.**

**Brief Description of the Accident.**—Mr. Edward Petre, flying a Martin-Handasyde Monoplane, fitted with a 60-h.p. Antoinette motor, left Brooklands on Tuesday, December 24th, 1912, at about 9.10 a.m., with the intention of making a non-stop flight to Edinburgh. At about 12.15 p.m. he was observed approaching Marske-by-the-Sea, Yorkshire, from the direction of Saltburn. At that time a high wind was prevailing. After passing over the village of Marske-by-the-Sea, the aircraft was at a height of about 500 ft., when it was observed to descend to about 400 ft. At this altitude the aircraft straightened out, then rose slightly, and subsequently dived to the ground, killing the aviator instantly. The aircraft was completely wrecked.

Mr. Edward Petre was granted his Aviator's Certificate, No. 259, on July 24th, 1912.

**Report.**—The Committee sat on Wednesday, January 1st, Monday, January 6th, and Monday, January 13th, 1913, and received the report of the Club representatives who visited Marske-by-the-Sea, together with evidence of eye-witnesses taken on the spot by them. Mr. G. H. Handasyde and Mr. H. P. Martin, of the firm of Martin and Handasyde, attended and produced plans of the aircraft, and gave evidence on various points raised by the Committee.

From the consideration of this evidence the Committee regards the following facts as clearly established.

- (1) That the aircraft was built in November, 1912.
- (2) That a very strong and gusty south-westerly wind was prevailing at the time of the accident.
- (3) That the aircraft at the time of the accident was heading into the wind at an oblique angle so as to cause its line of motion over the ground to be at right angles to that of the wind, and its course was thus north-west.
- (4) That from a height of about 500 ft., the aircraft, which had just previously passed over the village of Marske-by-the-Sea, descended about 100 ft. It rose again, both wings collapsed and the aircraft immediately fell to the ground. With reference to the collapse of the wings, no fewer than four witnesses who saw the accident from different points of view gave evidence that the wings collapsed in a downward direction.
- (5) That a number of pieces of wood and fabric were picked up to leeward as far away as 300 yds. from the scene of the accident, and in such positions that they must have fallen from the aircraft whilst still in the air.

**Opinion.**—The Committee is of opinion that the accident was caused by the collapse of the wings of the aircraft in the air.

**Recommendation.**—Seeing that this is not the first occasion on which wings of the Antoinette type have collapsed in the air, the Committee recommends that the Royal Aero Club should vote a sum of money for the investigation of this design.

In this particular instance the aircraft was removed by the local authorities almost immediately after the accident and any evidence which could have been obtained from the position or fractures of the parts was thereby lost. A good deal of the woodwork was burnt after the removal. The Committee has already made a recommendation that steps should be taken by the authorities to prevent similar destruction of evidence in future.

In view of the above recommendation, the Committee unanimously voted a sum of £20 to cover the cost of the investigation.

**Aviation Prize.**—A letter was read from Mr. A. Mortimer Singer offering a prize of £500 for a competition open to aeroplanes able to start from and alight on both land and water. The drafting of the Rules was referred to the Competitions Committee.

A unanimous vote of thanks was passed to Mr. A. Mortimer Singer for his very generous prize.



**Paris Conference.**—The questions of Hydro-Aeroplane Certificates and the Gordon-Bennett Aviation Cup for 1913 were discussed, and Mr. Roger W. Wallace, K.C., and Mr. Griffith Brewer were delegated to represent the Royal Aero Club at the Conference of the Fédération Aéronautique Internationale to be held in Paris on Tuesday, the 28th inst.

**Aviation in Ireland.**—The Secretary reported that at the request of the Aero Club of Ireland, he visited Dublin on Saturday last and inspected a ground proposed for a flying school, and that in his opinion, the ground was not large enough for the purpose. His report to the Aero Club of Ireland to this effect was confirmed.

**Public Safety and Accidents Investigation Committee.**

A meeting of this Committee was held on Monday, the 20th inst., at the Royal Automobile Club (by kind permission), at 8 o'clock, when there were present: Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. A. E. Berriman, Mr. G. B. Cockburn, Mr. Alec Ogilvie, Mr. Mervyn O'Gorman, and the Secretary.

**Erith Accident.**—The report of the Club representatives who visited Erith, together with the evidence of eye-witnesses taken on the spot by them, was considered. Capt. H. F. Wood, representing Messrs. Vickers, Ltd., attended before the Committee and gave evidence on various points.

The enquiry was adjourned till Monday, the 27th inst.

**Annual Dinner.**

It has been decided to hold the Annual Dinner of the Club on Thursday, March 6th, 1913. Full particulars will be issued to the Members in the course of the next few days.

**Balloon Prizes.**

Mr. A. Mortimer Singer offered two cups for competition during the year 1912, viz., Long Distance Balloon Competition and Balloon Competition in Ireland. As neither of these Cups were won, Mr. Singer has kindly agreed to renew the Competitions for the year 1913.

**Gordon-Bennett Balloon Race.**

The cup having been won by a representative of the Aero Club de France, the race for 1913 will start from Paris on Sunday, October 12th, 1913.

Each club affiliated to the Fédération Aéronautique Internationale has the right to challenge the holder, the Aero Club de France, and such challenge must be sent in before February 1st, 1913.

The Committee of the Royal Aero Club will select the three competitors to represent the British Empire, and intending candidates are requested to notify the Secretary on or before January 28th, 1913, of their willingness to compete, if chosen. Applications must be accompanied by a cheque for £20, the entry fee, which amount will be returned should the entrant not be selected.

**Gordon-Bennett Aviation Cup.**

The cup having been won by a representative of the Aero Club de France, the race for 1913 will take place in France. The exact time and place will be announced later.

The nature of the contest will be decided at the meeting of the Fédération Aéronautique Internationale, to be held in Paris on January 28th, 1913, at which the Royal Aero Club will be represented.

Each club affiliated to the Fédération Aéronautique Internationale has the right to challenge the holder, the Aero Club de France, and such challenge must be sent in before March 1st, 1913.

The Committee of the Royal Aero Club will select the three competitors to represent the British Empire, and intending candidates are requested to notify the Secretary on or before February 25th, 1913, of their willingness to compete, if chosen. Applications must be accompanied by a cheque for £20, the entry fee, which amount will be returned should the entrant not be selected.

**International Aero Show at Olympia.**

The International Aero Show organised by the Society of Motor Manufacturers and Traders, supported by the Royal Aero Club, will be held at Olympia from February 14th to 22nd, 1913.

Members of the Royal Aero Club are admitted free on presentation of their membership cards.

A room in the Princes' Gallery will be placed at the disposal of the members during the exhibition.

166, Piccadilly.

HAROLD E. PERRIN, Secretary.

## FROM THE BRITISH FLYING GROUNDS.

### Brooklands Aerodrome.

WHILST Mr. Bendall was out flying on a Bristol biplane, Thursday last week, the machine startled a covey of partridges, two of which were caught by the propeller and killed. On Saturday, at 7.45 a.m., Mr. Merriam, of the Bristol School, went up to test the air conditions, afterwards (about 9.30 a.m.) taking a pupil, Lieut. Crawford Kehrman, to do straights, the latter being in the pilot's seat and having control of the machine. After Mr. Merriam and Lieut. Kehrman had gone out Mr. Pashley went up on the Sommer biplane, but a thick fog coming up quite suddenly he had to make a hurried *vol plané* to earth, which he reached quite safely; and he was just in the act of turning his machine round when through the fog he espied the Bristol machine coming towards him at right angles, and as neither pilot was aware of the other's proximity it was not possible to do anything to prevent the violent collision which occurred, and which badly damaged both machines. Luckily no one was hurt, although all three had a very narrow escape, for the Bristol machine was thrown up on to one side by the force of the impact, and only the strength of the stanchions prevented the engine breaking loose, the machine speedily recovering its balance. Some idea of Mr. Pashley's narrow escape may be gathered from the fact that the gauge glass, which was fixed to the machine by the side of his head, was knocked off.

The wind in the afternoon was too "bumpy" for the holding of the altitude competition, which was consequently postponed until Saturday; but Mr. Barnwell made some circuits at a good height on the Vickers No. 5 and No. 7 monoplanes. Mr. Merriam was out on the Bristol tractor, and Mr. Raynham on the Coventry Ordnance Biplane.

The heavy rain which came down Sunday afternoon prevented any flying at all, and the bomb-dropping competition had perforce to be abandoned until next Sunday.

**Bristol School.**—Merriam was out early on Monday last week for a test, then up with Mr. Neville and Lieut. Blatherwick. Bendall out on another machine for solo, afterwards giving tuition to Mr. Archer and Lieut. Kehrman. Capt. Rickards and Lieut. Shekleton each made a couple of good circuits, latter pupil then out for good solo, Capt. Rickards following, describing figures of eight in good style. Merriam out with Mr. Archer for tuition trip, after which flying was abandoned for breakfast. Thick fog prevented flying later in the morning.

On Tuesday, Merriam out for test, flying round to wake pupils. Later as passenger with Mr. Neville, and with Lieut. Blatherwick

on straights, the latter pupil then flying four good circuits alone, for the first time, doing quite well. Bendall was out with Mr. Archer and Lieut. Kehrman for instruction. Capt. Rickards ascending on another machine for practice in figures of eight, flying splendidly. Lieut. Shekleton was up for similar practice, and also made an exceedingly good show.

Mr. Hall was out for several straights with Merriam as passenger and then alone. Merriam also being up with Lieut. Kehrman.



Mr. H. Macandrew, who, at the Maurice Ducrocq School at Brooklands, on the 14th instant, passed for his *brevet* on the little Farman belonging to the Ducrocq School.

Capt. Rickards and Lieut. Shekleton were both out again for final *brevet* practice.

School work was resumed after breakfast, Merriam making trial. Capt. Rickards then successfully passed the tests for his certificate, as also did Lieut. Shekleton immediately afterwards, the former showing great promise with his banked turns. Mr. Hall was up for straights with Merriam as passenger. Messrs. Neville and Archer obtaining similar practice. Merriam also up with Lieut. Kehrman, Bendall also taking Mr. Archer and Lieut. Kehrman. Merriam tested in the afternoon, but wind too bad for school work. Bendall tested later on, but wind still too bad.

After the rain on Wednesday morning Merriam was up for a trial, but wind too bad for pupils.

Too windy first thing Thursday. Bendall out about 8 a.m. with Lieut. Kehrman for trial of conditions, afterwards giving pupil landing practice. Merriam was up as passenger to Mr. Neville on straights, this pupil then going alone and doing well. Mr. Archer took Merriam as passenger, this instructor also sitting behind Lieut. Kehrman for several straights, Merriam finishing off by making high solo over Byfleet and *vol plané* into aerodrome.

Bendall made a test flight after breakfast with Lieut. MacLean, and having disturbed a covey of partridges, managed to "secure" a couple with his propeller, with obvious results to the latter. Wind too bad later in the day, and work was confined to the hangars.

Merriam made a test on Friday, but "Bristol" only machine out, wind being bad. Later Merriam tried again, taking Lieut. MacLean but still too rough for school work. Merriam out for trial in the afternoon, taking Lieut. Kehrman, afterwards behind same pupil on straights. Bendall on another machine for solo, and gave tuition flight to Mr. Archer and Lieut. MacLean, the latter going for straights and flying well. Mr. Neville made four good straights, his landings being particularly good. Merriam and Bendall were both out on the "Bristol" E.N.V. tractor. Darkness preventing further flying.

On Saturday, after a test, Merriam was out as passenger to Lieut. Kehrman on straights, but a sudden fog rising up caused abandonment of school work. Bendall earlier made a test. Merriam was out in the afternoon for a test on the Bristol tractor, but conditions too bad for pupils.

Merriam made a test on Sunday, with Mr. Archer as passenger, then putting this pupil in pilot's seat for straights, he afterwards

went up as passenger to Lieuts. Kehrman and Blatherwick. Messrs. Lane and Neville each made two straights, but wind too bad for circuits. Merriam finished morning's work with an instructional flight to Mr. Lane. Wind and rain prevented any flying for the rest of the day.

**Vickers School.**—Barnwell, having made test flight on one of the school biplanes, on Monday, last week, Captain Salmond then flew several circuits in good style. Knight made a short flight to test petrol adjustment, and then Captain Salmond again went for circuits, flying very steadily. Unfortunately he got into the backwash of another machine, and landed rather heavily, doing some damage to propeller, chassis, &c. Fog prevented further flying.

Wednesday morning Barnwell made a few circuits on No. 7 monoplane. Too windy for pupil work. Next day, in the afternoon, Mr. Barnwell made more circuits on monoplane No. 7, but found it very windy. Both Barnwell and Knight were flying Friday afternoon on No. 7 and No. 5 monoplanes respectively, Barnwell with a passenger.

Saturday, fog prevented flying in the morning. In the afternoon, Barnwell flying monoplanes No. 5 and 7 alternately, testing for relative weather capacities.

Capt. Wood, Barnwell, and Knight were all flying No. 5 monoplane Sunday morning. Rain and rising wind stopped flying later.

## Eastbourne Aerodrome.

On Friday afternoon last week the weather improved considerably and shortly after 3 p.m. Fowler was able to get out on the Bristol. He, however, found it too bumpy to allow any of the pupils to take the pilot's seat. Lieut. Minchin was given a passenger flight, and had the lever most of the time. Saturday morning turned out to be a dead calm, and about 8 a.m. Fowler started on his 50-h.p. Gnome-Blériot, being away for nearly 20 mins. This is the first flight he has made on the Blériot since it has been modernised and fitted with new wings. The old machine looked very smart, and appeared to be a good deal faster. On returning he made several flights on the Bristol with Lieut. Minchin, who has now quite mastered the control of the machine and, with a little more practice in landing, should shortly be fit to go for his certificate. Messrs. Roberts, Thornely and Thompson were also given some instruction, all doing well. There was too much wind in the afternoon for any school work, and as there were a few spectators Fowler went up on the Bristol. The spectators had their money's worth, as they not only saw a flight, but also a smash, Fowler ending up in a dyke. He was coming towards the sheds with the wind behind him, when his engine petered out. Coming down with rather a steep *vol plané* he did not allow for the wind, with the result that the machine ran just a bit too far, and gently rolled into a dyke. Luckily, beyond three or four broken ribs in the top plane, little damage was done, although getting the machine out was no easy matter. Mr. Lerwill, a local pupil, is to be congratulated on being gazetted to the Royal Flying Corps.

## London Aerodrome, Collindale Avenue, Hendon.

**Grahame-White School.**—Friday afternoon, last week, being calm, the pupils made the most of it, Lieut. Power doing straights with Mr. Manton on No. 7 machine, Mr. T. H. Bayetto getting in good rolling practice on 4b.

**Blackburn School.**—Monday, Tuesday and Wednesday, last week, rain, wind and fog prevailed all day and every day. Thursday, in the morning, school commenced at 10 a.m., and work proceeded till 1 o'clock, consisting of two test-flights of 10 mins. each by Mr. H. Blackburn, Messrs. Buss and Glew 40 mins. each in straight flights, and Mr. Morris 20 mins. practice in rolling.

At 11.10 a.m. Friday, a test flight was made by Mr. H. Blackburn, followed by a preliminary straight by Mr. Foggin, this being Mr. Foggin's first experience of a Blackburn. After this the fog rolled up and put an end to school work.

Mr. H. Blackburn, on Saturday, gave a fine exhibition flight, on the school rolling machine, of about 15 mins. duration.

After a test flight, at 7.45 a.m. on Sunday, of 10 mins. by Mr. H. Blackburn, Mr. Buss took over the machine and made a very satisfactory flight of 10 mins., doing circuits and figures of eight and landing in perfect style. After this Dr. Christie practised straights for 25 mins., then the fog once more closed the proceedings.

**Blériot School.**—Tuesday, last week, the weather was foggy, but for a short period in the morning there was comparative clearness during which Mr. Slack took out No. 2, after repairs, for a trial after which the weather became dull again, preventing any school work.

On Thursday an excellent morning's work was able to be done; Messrs. Reilly, Teulade, Desoutter and Clappen all being out doing good straights on No. 2. All are now doing well and flying steadily. The wind rising at midday, however, put a stop to further work outside the sheds.



Capt. J. C. Halahan, late of the Dublin Fusiliers, and who took his pilot certificate in October last on a Grahame-White biplane at Hendon, who has been appointed Manager of the British Deperdussin Flying School at Hendon.



Friday morning was wet and windy, but it was quite fine in the afternoon, and M. Gandillon was out on No. 3, flying quite well, and Messrs. R. Desoutter and Clappen were doing straights on LB 2. Lieut. E. Conran temporarily left the school, where he has been practising for his superior *brevet*, to take up his duties with the Royal Flying Corps on the Plain.

**Deperdussin School.**—Monday last week thick fog stopped air work. Next day, at 8.30 a.m., No. 4 tested by Mr. Brock and handed over to Mr. Whitehouse, who flew several circuits in excellent style; Mr. Valazzi straights on No. 3. 12.30 to 1.30, Valazzi and Scott straights on No. 3, Lieut. Hordern rolling on No. 2 taxi. At 3 p.m., Mr. Whitehouse started *brevet* test, but thick fog coming on he had to come down.

On Thursday, at 8.30 a.m., Mr. Brock, two circuits on No. 4, followed by Mr. Scott, one circuit, but had to come down owing to fog; at 10.30 a.m. Lieut. Hordern rolling on No. 3 *brevet* machine.

Mr. Brock tried wind Friday on No. 4, but found it too strong for pupils. At 3.15 p.m. Mr. Whitehouse, circuits and figures of eight on No. 4. Messrs. Valazzi and Lieut. Hordern straights on No. 3, the latter making great progress. Later Mr. Scott circuits on No. 4.

Mr. Whitehouse went for *brevet* tests Saturday about 2 p.m., and passed in splendid style, reaching an altitude of 800 ft. or more. Landings very good, bringing up after first portion of test within three yards of observers. His performance was all the more creditable as a stiff wind was blowing at the time.

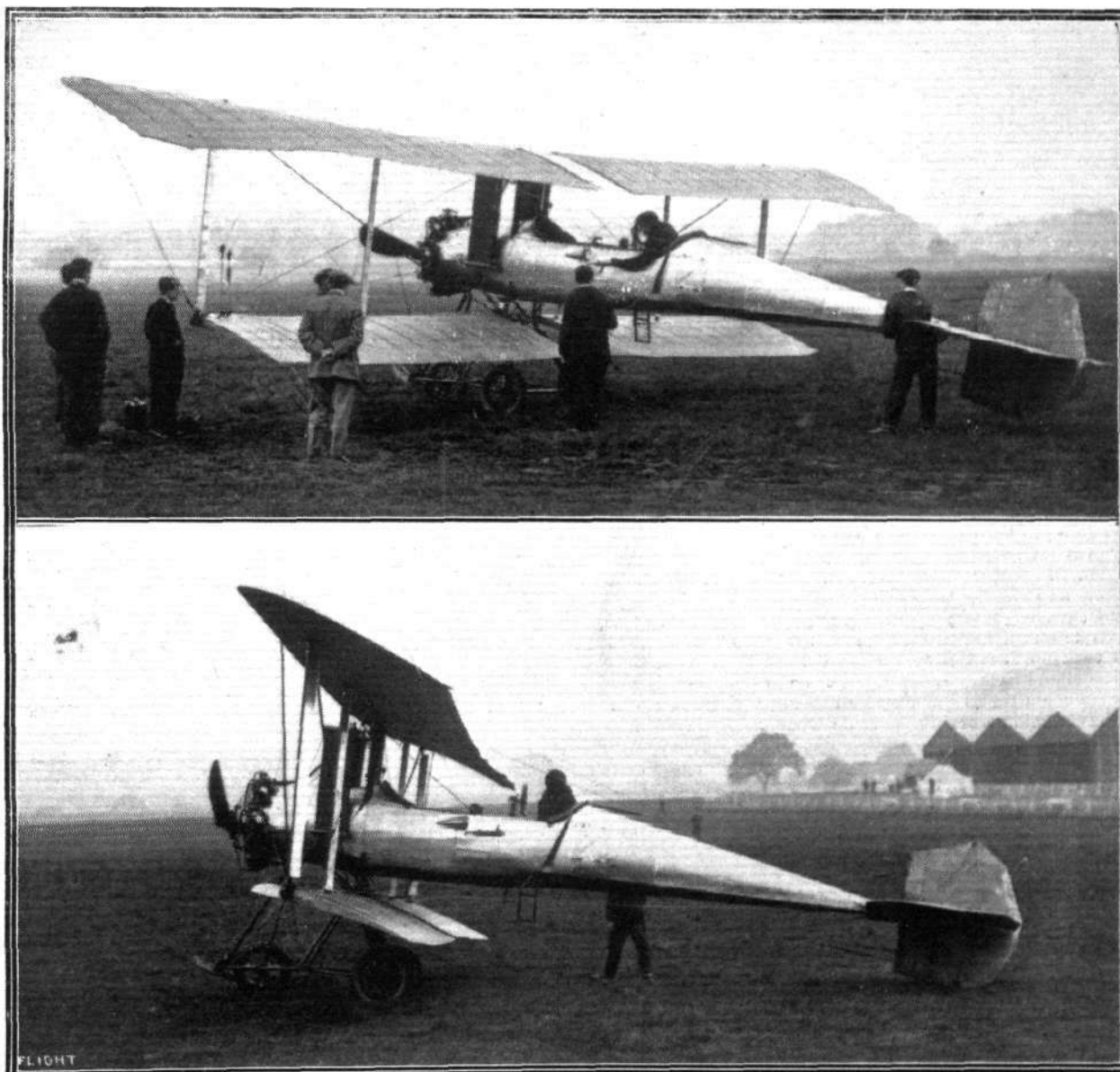
Monday there was no work, too much wind.

**W. H. Ewen School.**—During the early part of last week, wind and wet combined to render outdoor practice impossible. On

Monday, Mr. H. Jones, an Australian pupil, joined the school, and on Wednesday another pupil, Mr. Harry Stewart, was enrolled.

It was not till Thursday that a welcome break in the long spell of bad weather allowed the school machines to be taken out. Instructed by M. Baumann, Mr. E. T. Prosser was doing good straights on monoplane No. 2, and Mr. H. Jones had his first instructions on the same machine. Mr. Lewis Turner gave several good exhibition flights on the 35-h.p. Caudron biplane, and M. Baumann also put up a good flight on the same machine.

On Friday morning the weather was again bright, but there was a strong breeze blowing. Mr. Lewis Turner and M. E. Baumann were both out on the 35-h.p. Caudron biplane, and were flying very steadily. Both pilots agreed, however, that the wind was too strong for tuition work. After lunch the wind died away, and from 2.15 the pupils got in a lot of useful work, continuing their practice till the light failed. M. Baumann had out monoplane No. 2, and Messrs. H. Jones, E. T. Prosser and H. J. Torr were all doing good straights. Mr. Lewis Turner took up the 35-h.p. Caudron biplane for a test flight, and then handed the machine over to Mr. Lawford, who was flying straights in good style and landing well. The principal event of the afternoon, however, was the taking of another Caudron *brevet*. Mr. L. Russell, the successful pupil, went through the test in splendid style, flying at an average altitude of 350 ft. and landing perfectly. With a little further practice Mr. Russell bids fair to become an excellent pilot. It is interesting to note that this is the first *brevet* obtained at Hendon this year, and also that the first *brevet* taken in this country in 1913 was passed at Brooklands on a 35-h.p. Caudron biplane, a sister machine to the one flown by Mr. Russell.



Two views of the Breguet biplane, fitted with a 90-h.p. Canton Unne engine, on which M. Richet has been making some successful flights up at the Hendon Aerodrome.



On Saturday the wind was too strong to allow pupils out. During the afternoon Mr. Lewis made numerous flights on the 60-h.p. Caudron biplane, taking up several passengers, while M. Baumann put up a splendid exhibition flight on the 35-h.p. Caudron biplane.

## Salisbury Plain.

**Bristol School.**—Jullerot out for a trial on Monday, last week, at 10.30, but found wind much too strong, and no further flights were attempted. No improvement had taken place in the weather on Tuesday, and although England made a trial nothing further was done. Rain and wind rendered flying impossible Monday, and work was busily carried on in the hangars. On Thursday, Jullerot and England both made trials, and reported weather gusty. Lieut. Vernon particularly wanted to go out for his certificate, which he eventually did successfully, passing in a wind of fully 20 miles an hour, and putting up a good performance generally. This provides fine evidence of the instruction meted out to pupils and the proficient state they arrive at before taking their certificates at these schools. Jullerot tested a newly erected biplane, but heavy rain drove everyone to shelter. England made a trial on Friday and then Lieut. Littleton successfully passed the certificate tests, under the observance of Major Brooke-Popham and Major Boyd Moss, this being the fourth certificate gained this week at the "Bristol" Schools.

Jullerot was out for half an hour solo with Mr. Tower, then taking same pupil up on a biplane for a flight. Lieut. Vaughan made a good solo on a biplane, England taking Mr. Tower for tuition, and then flying over to Upavon with Lieut. Littleton. Jullerot took a prospective pupil for a flight in side-by-side monoplane. Prince Cantacuzene flew over to Upavon and back on an 80-h.p. Bristol monoplane with a passenger.

England tested in the afternoon with Mr. Tower, after which Lieut. Vaughan was out for a good biplane solo. Jullerot tested a school single-seater monoplane, a tandem monoplane, and a side-by-side monoplane, but rising wind prevented further work.

Although the wind was fairly high Saturday morning, Jullerot was out for a flight lasting an hour and a half in one of the tandem monoplanes, flying all round Salisbury and Shrewton. England was in another monoplane for a quarter of an hour with Mr. Tower as passenger, afterwards taking this same pupil for a tuition flight in a biplane, after which Mr. Tower ascended for his first solo, making quite a good show. Jullerot was in the meantime with Lieut. Vaughan as passenger in a side-by-side monoplane, flying round Shrewton and Netheravon and back to the hangars. England was up for a circuit on a single-seater monoplane and then on a side-by-side machine, whilst Lieut. Vaughan completed three good solos on a biplane. Jullerot attempted to commence school work in the afternoon, but after a solo lasting ten minutes in a tandem monoplane, decided that the conditions were too bad for pupils.

**Royal Flying Corps.**—Wednesday of last week saw a little change in the weather, and Major Brooke-Popham was out on factory-built biplane 203, with Sergt. Bruce as passenger, scouting around the Plains at a height of 3,000 ft., finishing with a fine glide.

On Thursday, owing to bad weather, no outdoor work was possible, but officers and men were busy dismantling the monoplanes which are going to Farnborough to be strengthened.

Friday was an ideal morning for flying, and the corps took full advantage of it. Major Brooke-Popham made a splendid flight to Warminster and back, with Sergt. Sharpe as passenger, on biplane 203, at a height of 4,300 ft., covering the distance in 45 mins. Afterwards he was flying around the camps at a height of 1,800 ft. He then took up Lieut. Stopford for a flight to Upavon Central Flying School and back. Lieut. Carmichael made a test flight with Air Mechanic Martin as passenger on Maurice Farman 216, and, finding the machine working well, he went up again to a good height and headed off towards Farnborough. Sergt. Kidd made three flights on M. Farman 214, once taking up Air Mechanic Bredding.

In the afternoon Major Brooke-Popham took Lieut. Stopford as passenger on biplane 203 for tuition, after which Lieut. Stopford made his first solo trip on the biplane. Major Brooke-Popham then took up Corpl. Golden, R.A.M.C., for his maiden flight. Lieut. Stopford made another good flight and showed splendid promise. Sergt. Spencer and Sergt. Goodchild have joined the Upavon Flying School for tuition. Further work has been confined to sheds owing to boisterous and treacherous winds.

## Shoreham Aerodrome.

SATURDAY last Lieut. Batty Smith and Wynne Roberts, who have joined the Avro Flying School, commenced rolling practice. Gaskell was doing straights earlier in the week. The last named fouled the fence just after landing, which necessitated some repairs. Sims was up doing circuits several times during the day.

Monday, a gale and very heavy rain prevented flying. Work was going on in the sheds, and tuning up the new 40-h.p. Isaacson-engined machine, which will be out as soon as weather moderates.

Great regret was felt that a collision in the fog at Brooklands prevented Mr. Pashley from paying his promised visit on Saturday.

## South Farnborough.

**Royal Flying Corps.**—Last week, on the Thursday, experiments were carried out on the Ash rifle ranges to ascertain the effect of rifle and machine gun fire on an aeroplane propeller and engine, under working conditions. The engine and propeller were mounted on an armoured motor lorry. Firing then took place at different ranges, and from various angles, but the results of the experiments were rather inconclusive. The next week or so will also see the establishment of the first Military aviation station at any considerable distance from headquarters, mention of which was made in last week's issue of FLIGHT. Montrose, in Scotland, will presumably be the chief military aviation station in North Britain. Montrose, lying as it does on a comparatively flat coastline between Aberdeen and Dundee, should become a place of strategic importance as a base from which the patrolling of that portion of the east coast can be efficiently carried out. This duty will fall upon the officers and men of the second squadron of the military wing of the Royal Flying Corps, which will be stationed at Montrose; and there is also good grounds for believing that a Naval station will be formed at the same place or close to.

The men of No. 2 squadron were paraded on Saturday at the Blenheim barracks, North Camp, in full marching order. The weather just at the time was ideal, and the sun was shining brilliantly—for a wonder, considering the weather which has been experienced here during the last few days. Sergt.-Major Fletcher is to be congratulated on the smart appearance of the squadron, the men of which looked decidedly businesslike in their new equipment, which includes revolver holsters and cartridge pouch, revolvers being the only weapon of defence carried. Inspection of the men was carried out by Capt. Becke.

Col. Cody was out last Saturday on one of his new machines, built for the Flying Corps; he had, however, to come down owing to slight engine trouble. A Caudron biplane also came over to the Aircraft Factory from Hendon, and is fitted with a 50-h.p. Gnome engine. During the week some good flying was carried out on the various machines belonging to the corps. Lieut. Herbert was out on the Maurice Farman 215 several times, taking up passengers on two or three occasions. 1st Air Mechanic Wilson and Air Mechanic Ware accompanied Lieut. Herbert during two of his flights, and Lieut. Christie was also a passenger with him. On the Friday, Lieut. Herbert was out on the Maurice Farman for about half an hour. Lieut. Martyn was also out for two or three short spins on the same machine. The BE. type was also flown several times during the week. The Breguet machines of No. 4 Squadron, however, put in most work. Sergt. Hunter, of No. 4 Squadron, put up something in the way of a record for the number of passenger flights. For several weeks past he has done little flying, and has only just recently returned off furlough. Since his return, however, he has certainly made up for lost time. On Thursday last he was up practically all day on the 100-h.p. Gnome-Breguet machine and commenced flying about nine o'clock in the morning. Sergt. Hunter took up the following as passengers between that time and about quarter-past eleven: Air Mechanic Jenkins, Air Mechanic Chambers, Lieut. Maclean, Lieut. Chinnery, Sergeant-Major Thomas, Sergeant Wright, Air Mechanic Aukert, Lieut. Mackworth. The weather was moderate and during the afternoon Sergeant Hunter again commenced his passenger carrying flights, starting about 2.30 and finishing about four o'clock, and took up the following passengers: Air Mechanic Aukert, Sergeant Wright, Air Mechanics Ledger, Thomas, Morgan, Kemmings, and Sergeant Kemper.

On Friday, Major Raleigh was out on Breguet 210 for a short spin, the wind was rather bumpy. Sergt. Hunter then went alone for about ten minutes on the same machine, afterwards taking up Capt. Board and Lieut. Chinnery, Staff-Sergt. Richardson and Sergt. Latimer. Saturday there was little done, and on Monday the weather was too wet for flying. Tuesday morning, however, the small Caudron biplane, piloted by Caudron himself, was out in nasty weather, but behaved splendidly, and seemed very stiff in the choppy wind. The Caudron machine is certainly a handy looking little affair, and should certainly be heard more of in the future. Verrier also favoured the public with some tricky flying last week, when he was down here putting a new Maurice Farman through the necessary Government tests for height and speed.



## Mr. Hamel at Leicester.

MR. HAMEL paid another visit to Leicester on Saturday afternoon and made three fine flights on his Blériot machine from the Old County Cricket Ground at Aylestone. Of the three the last was the most spectacular; Mr. Hamel climbing at a very steep angle to an altitude of 2,000 ft. and then descending by a spiral *vol plané*.

## EDDIES.

FOLLOWING on my remarks recently relating to MM. Sommer and Robert Esnault Pelterie retiring from the aviation industry, there is, according to rumours, another firm in France whose machines, one cannot help noticing, employ steel almost exclusively as a medium of construction, that does not find itself in particularly good circumstances just at the present.

I do not pretend to know a great deal more about what are the best materials to use for aeroplane construction than any ordinary mortal who has donned overalls, and who has done his share of practical aeroplane construction, but the question immediately occurs: "Are all-steel machines wanted yet?" Then take the machines that have been the most popular during the past year. It is rather striking to notice that they have been the machines that have been constructed of a judicious mixture of wood and steel, with rather more wood than steel.

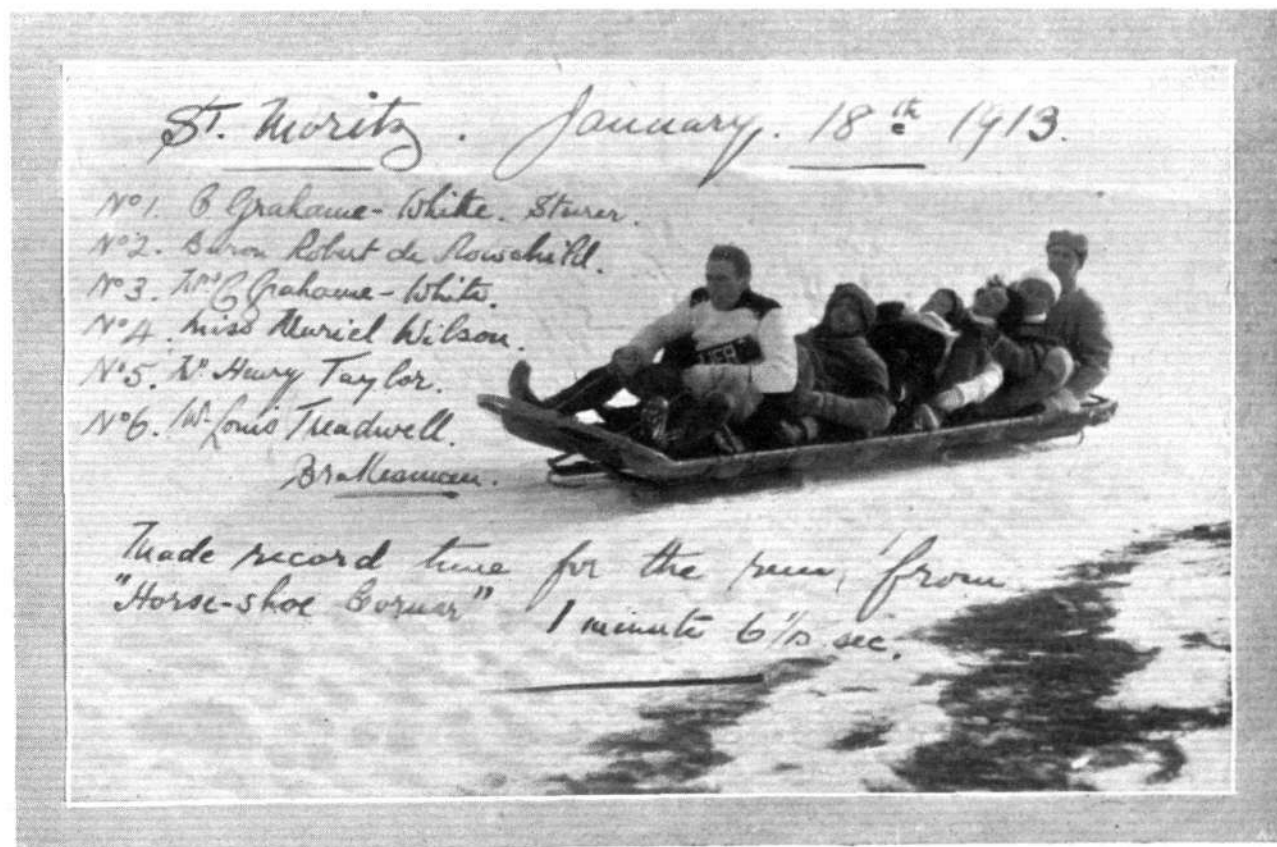
This is only touching on one factor that appeals to me as being one that has gone against some firms achieving the success that might have been theirs. With other French firms in mind, I ask myself: "Have they given sufficient attention to what their War Department requires?" In my mind at the moment are two French firms whose machines are not as serviceable as they might be, for the main reason that the landing chassis employed in both cases is too delicate to stand up to really hard work. One of these machines, too, does not show all that is required of it in the way of "holding the air." Yet, as far as I have gathered from reports, the firms in question have not made any serious efforts to remedy these faults up to the present. According to reports, one of these firms is very "hard up" at the

moment, and the other has been given another six months' existence.

The word "taube," which in German literally means "pigeon" and was originally used to indicate the Rumpler, or German-built Etrich machine, has come into general use in Germany to indicate a war aeroplane in the same way that the word "avion" has been adopted in France.

Mr. A. V. Roe's frequent motor cycle jaunts between London and Manchester have apparently brought home to him very strongly the failings of the motor cycle at the present time, so much so that he has designed a novel form of two-wheeled vehicle in which the driver is almost totally enclosed by a streamline body. In the design, which was published recently in one of our motor cycling contemporaries, two small wheels, one on either side of the rear wheel, are arranged so that they may be raised clear of the ground when once a start has been obtained. Conversely, in pulling up, they may be lowered to steady the machine. It is likely that they would also come in useful if the vehicle showed a tendency to skid at any time.

It is not difficult to trace the effects of aeroplane designing in the drawings of this little bi-car that Mr. A. V. Roe has conceived. The steering wheel is in every way similar to the control of the 35-h.p. Green-Avro biplane that was so successful, and the steering is operated by stranded steel cable. I understand that Mr. A. V. Roe is having one of these machines built, and, when tests have brought the vehicle to the stage



MR. C. GRAHAME-WHITE RECUPERATING.—The photograph, which he has sent us from St. Moritz, shows him steering his crew round a banked turn on the bobsleigh run.

when it is ready for the market, he will enter into negotiations for carrying on their manufacture on a considerable scale.

Buzzwaggon—suggested as a new word for an aeroplane, by an American friend, who is tired of calling a machine a 'bus.

There may shortly be another French pilot flying at Hendon, for I hear that the Aircraft Manufacturing Co. intend in a week or so's time to have Chevillard flying for them at Hendon, testing and demonstrating Henry Farman biplanes. Chevillard has been flying in France for Farman for quite a considerable time, and most of his work has been done at Buc.

An interesting exhibit at the forthcoming Olympia Aero Show will be the 160-h.p. Gnome-engined Deperdussin monocoque, on which Vedrines flew to victory in the Gordon-Bennett Cup Race of 1912. It will be shown on the stand of the British Deperdussin Aeroplane Co., Ltd.

No doubt by the time Mr. Grahame-White returns to England he will find that his health has benefited considerably, for at St. Moritz, where he is taking a holiday, he has been entering whole-heartedly into the sports that are generally indulged in at such winter resorts. Quite at home on an aeroplane, it seems that he is equally at home on a bobsleigh, for early in this month, on the day that the St. Moritz Bobsleighing Club opened its season, he completed the run in a minute and a quarter, which was the fastest time for the day. Since then he has been doing the run daily, and has a record of 1 min. 6 $\frac{1}{10}$  secs. to his credit. Mrs. Grahame-White was almost invariably a member of his "crew."

It is rather interesting that both Drexel and M. Santos Dumont were staying at the same hotel as Mr. and Mrs. Grahame-White.

Readers, I know, will regret to hear of the death of Mr. Harold Barlow, who passed away a few days ago at Bournemouth. He will be remembered as the sportsman, hailing from New Zealand, who developed such a keenness for aviation that he awarded cash prizes to the value of £400 to be competed for in connection with the Aerial Derby last year. At the same time he bought from the Grahame-White Aviation Co., their 70-h.p. Nieuport two-seater and their old 50-h.p. baby biplane. Incidentally, so taken did he become with B. C. Hucks' manner of piloting that he paid that same firm no less than £1,000 to release Hucks from his contract with them.

Shortly afterwards Mr. Barlow bought a new Blériot two-seater, on which Hucks flew him back as a passenger from Paris to Hendon. It is that same machine that Hucks has used ever since in his flights in connection with the *Daily Mail*. But it is now his own property, he having purchased it from Mr. Barlow some few weeks back.

I often wonder why the Shoreham aerodrome is not more popular than it is. They have, perhaps, had a fair amount of flying there during the past year, but not

nearly so much as they might have had, considering the facilities the ground offers. It is not quite so near London as most people would like, but it is not a thousand miles from Brighton, where you can get quite as much fun as you can up in town here, if you know the right way to go about it. That at any rate is a point that is to be considered where young and frisky pupils are concerned. The ground itself is about as smooth and flat as any you could wish for, and there's the great blessing that there is a station—Bungalow Town halt—not two minutes' walk from the sheds.

At the present time the Avro school with four biplanes is at work there, and getting on for a dozen pupils are busy, when the weather suits, going through their tuition under the direction of Mr. Sims, who flew for his ticket at Brooklands. Other shed-holders are Lieut. Burga, of the Peruvian Navy, whose monoplane has gone back to the Avro works to undergo alterations, and Mr. England, who is experimenting with a biplane.

Last Sunday, braving a gale of wind and a sky that threatened much rain, I went out to the Shoreham ground with a friend. The walk from the station was not a long one, but we were heartily glad to settle down in low cane chairs in the extremely comfortable new club pavilion that has lately been erected, and, before a blazing fire, to partake of hot toast and steaming tea at the invitation of Mr. Henry Gonne, the Secretary.

It must have come as a very gratifying send-off to the private limited company, into which the Avro organisation has just been turned, to receive a further order from the War Office for five 50-h.p. Gnome-engined single-seater biplanes. This order comes in addition to the four that were ordered not many weeks since. By the way, they are still on the look out for larger premises, so if anyone, reading this paragraph, knows of a fair-sized works suitable for aeroplane construction, situated conveniently near any of our best-known aerodromes, no doubt Mr. H. V. Roe will be thankful for any suggestions they could offer.

Mr. Harry Preston, managing director of the Royal York and the Albion hotels at Brighton, both of them well known to the aviation fraternity, is really one of the most charming men one could hope to meet in a day's march. Being stranded there after the Brighton-Shoreham Aero Club dinner, on Saturday last, with dress clothes that I did not particularly want to wear on the Sunday, he fixed me up with a lounge suit that, although it was skin tight, and threatened to burst at every step, was, none the less, much to be thankful for. He is particularly keen on aviation, and has most exciting recollections of a passenger flight he had with Mr. Grahame-White when the latter was giving hydro-biplane exhibitions there at Brighton last summer.

He told me that he intends to invest in a hydro-biplane of his own shortly, so that the guests at his hotels, and others for that matter, may have exceptional facilities of experiencing the joys of water-flying. The machine he has his eyes on is one that Messrs. Saunders, the celebrated yacht builders of Cowes, are turning out at the



present time. For the moment, Messrs. Volks are endeavouring to obtain permission from the local authorities to erect for him a hangar to house it on the sea shore not far from his hotels.

I hear that Col. Seely, on the 28th of this month, will receive a deputation, introduced by Lord Desborough on behalf of the students of the International Correspondence Schools, who are presenting to the War Office the 50-h.p. Gnome-Blériot monoplane on which one of their students, Mr. R. Bertram Slack, made a flying tour of Great Britain during the past summer. Altogether, on that trip, it is interesting to record that he covered upwards of 1,700 miles, and that without breaking so

much as a single wire. Subscriptions from students towards the purchase of this machine, so that they might present it to the nation, were received from all parts of the world where the I.C.S. organisation is established.

Observations have led to the inference that our Naval Authorities have in view important developments concerning the establishment of an aviation centre near Portsmouth. Langston Harbour—a harbour to the east of Portsmouth, of approximately the same shape and size, but a good deal shallower than Portsmouth Harbour—will be probably the scene of activity. Its location makes it especially suitable for hydro-aeroplane work.

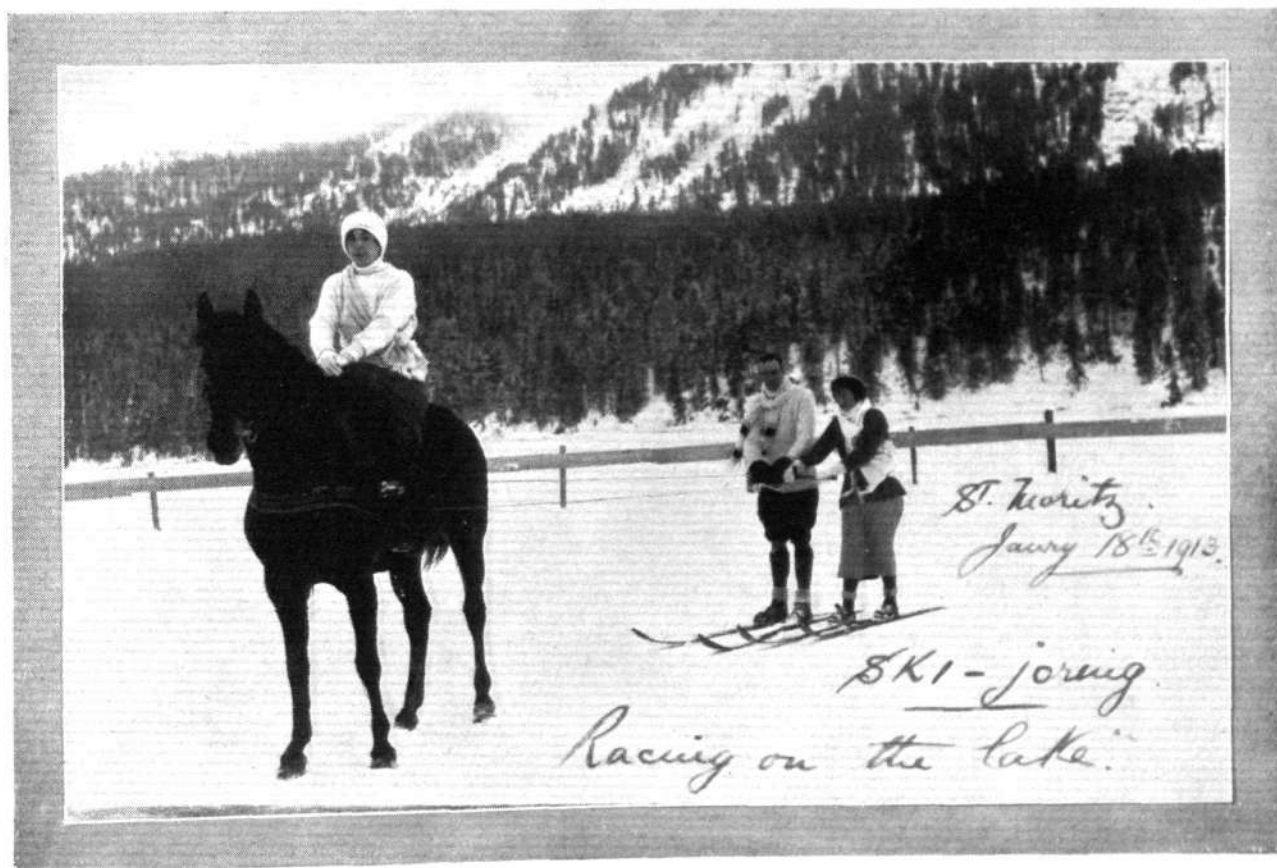
"OISEAU BLEU."

## FLYING AT HENDON.

THERE was an hour and twenty-five minutes of almost continuous flying at Hendon aerodrome last Saturday, no fewer than eighteen flights being made during the afternoon. The weather was rather dull earlier in the day, but cleared up later on, and there was a stiffish breeze blowing but not enough to make flying unpleasant.

Before the proceedings officially commenced, Pierre Verrier made a couple of trial flights on one of the Maurice Farman biplanes, taking with him a passenger on the first trip. Shortly after, Mr. Whitehouse—one of the pupils of the British Deperdussin School—went up for his *brevet*, which he obtained in excellent style, flying one of the small Deps. Just before 3 o'clock Verrier went up again on the Maurice Farman and put up a very fine performance, making some extraordinary switchbacks and banked turns. M. D. Manton was the next up on the Grahame-White 'bus, and he was followed by Verrier, who this time took a passenger with him and remained up for about 9 mins. After this, Lewis Turner made a short flight on the 60-h.p. Caudron biplane, but, as the engine was pulling very badly, he came down to have matters put right. While he was up the G-W 'bus again ascended, after which Marcel Desoutter made a long flight, lasting about 17 mins., on the Blériot monoplane. The sun made its welcome appearance just as he ascended, and his machine looked

very pretty with the sun shining on the wings, with a background of grey clouds and patches of blue sky. Five other flights were made during this one of Desoutter's, three of them commencing almost simultaneously. These flights were made by Manton, who flew the "G-W" 'bus for 10 mins., Turner for five mins. on the Caudron (the engine of which was now pulling much better), Verrier with Gordon Bell on the Maurice Farman executing some of his banked turns and switchbacks, H. Blackburn (who made a sensational flight of about 15 mins. on the Blackburn monoplane), and M. Baumann (who made quite an excellent 15-mins. flight on the 35-h.p. Anzani-Caudron biplane). The latter finished up with a well executed *vol plané*. During the latter flight Manton took up a passenger on the "G-W" 'bus, after which H. M. Brock started out on the 35-h.p. Anzani-Deperdussin monoplane, but made an unexpected descent at the far end of the aerodrome, apparently owing to engine trouble. At about four o'clock Turner made another flight on the 60-h.p. Caudron, taking with him a passenger and remaining aloft for six minutes. He was followed in quick succession by Desoutter on the Blériot monoplane and Verrier, on the Maurice Farman. The Caudron's engine was now going in fine style, humming like a Gnome, so after the last passenger flight, Turner wound up the proceedings of the day with a short solo flight on this splendid biplane.



Mr. and Mrs. Claude Grahame-White ski-joring on the lake at St. Moritz.

# HYDRO-AEROPLANES—II.

By V. E. JOHNSON, M.A.

## The Floats.

NATURALLY in designing their floats, some took as their model the hull of a fast racing motor boat, evidently because here they saw a partial solution of the problem. The design taken was that of the hydroplane or gliding boat. In these boats the faster the speed the less the extent of boat surface in contact with the water—thereby reducing the extent of wetted surface to a minimum and so lessening the resistance. In Fig. 6 we have a cigar-shaped body *i.e.*, a hull to which are fitted on either side a number of inclined surfaces like a venetian blind. When a boat of this character is driven through the water by a propeller not in the water but in the air, the tendency is for the weight, which is first of all supported by the boat-like hull, to become gradually supported by the inclined planes or slats. The boat thereby tends to rise out of the water. The greater the speed obviously the less the number of inclined surfaces required, and the number of immersed planes will thus become less and less—the resistance thereby diminishing proportionately—until finally we have the machine skimming over the surface of the water supported, it may be, solely on the four lowest inclined planes. It should also be noted that the slats as well as being very efficient hydroplanes are also very efficient aeroplane surfaces, as was first shown by Philips. The machine is thus supported partly by water and partly by air. In a machine of this description, the propeller must either be an aerial one or one fitted on an inclined shaft, or else when the hull rose out of the water, the propeller would rise with it and thereby lose all its efficiency owing to the great differences in the two types. (This design was the original one tried by Fabre, but given up by him on account of the planes picking up weeds and other floating debris. The same idea has quite recently been revived by Messrs. Short Bros. (Patent 22407), see Fig. 7. It will be seen that there is a set of twin circular section floats of streamline form as floats, and a series of horizontal cambered slats or vanes (termed hydrovanes) which are used for hydroplaning purposes. Each set of hydroplanes is so attached to the chassis as to be capable of being drawn up out of the way when alighting on land. The tail of the machine is also fitted with a series of hydrovanes, D. They are attached to a tube controlled by the pilot—this tube

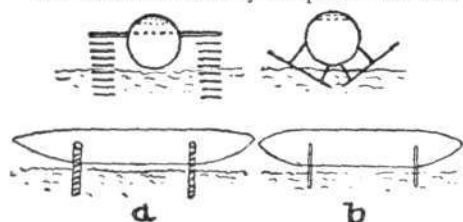


Fig. 6.—(a) Forlanini-Del-Fabro's hydroplane. (b) Cracco and Ricaldoni's hydroplane.

communicates with a tank, B. A float, C, is arranged to support the machine when on the water. It will be noticed the principal hydrovanes are carried well forward—but in all machines of the tractor type in which the weight is well forward—there is a tendency more or less when alighting—especially if the water be rough and the prow of the float strikes a wave, for the whole machine to turn a somersault—a sudden application of the brake on the front wheel of a bicycle has exactly the same effect. The hydrovanes, D, are set in such a manner that as soon as the machine touches the water (tail horizontal) these vanes begin to exert a depressing effect—but as this depression is increased, their negative angle of incidence is so altered until it either becomes zero—or even positive and so causes the tail once again to lift. This effect can, if necessary, be still further augmented by depressing the front part of the tube A, so that water is forced up into the tank B and so assists in weighing down the tail. The support of the vanes, A, it will be noticed is also tubular, and can be used for the same purpose. The depressing of the tail in this manner and consequent checking of the speed of the machine, as well as the tendency it would undoubtedly have under certain conditions of

jerking up the nose of the machine, would be to cause it finally to probably pancake badly, with serious damage to the floats and possibly the whole machine. A great deal would undoubtedly depend on the smartness of the pilot. It scarcely seems possible that the water-catching tube would act quickly enough unless it were of some size, and in that case it would appear that the water resistance to the pipe, J, through the water, might more than compensate for the extra weight deposited in B.

Owing to the drawbacks to the hydrovane type of float already stated, Fabre invented the well-known type of float which now bears his name, *i.e.*, a flat-bottomed float with a curved upper surface (see Fig. 8 (i)) set at rather a large angle of incidence. Their plan form is usually approximately square—or with a length slightly in excess of their breadth. They permit, when the flotation is ample or the machine well surfaced, *i.e.*, lightly loaded, a rapid get off, and they also act in the air as lifting surfaces—their somewhat large angle of incidence, however, must give rise to considerable drift and therefore proportionate resistance. In theory they have been considered to show no tendency to dive—this is only correct, however, so long as the leading edge does not dip under the water, should it do so, a dive must be the inevitable result. Being a short flat-bottomed float (fore and aft), they are more or less subject to violent shocks when alighting, which has to be minimised by more

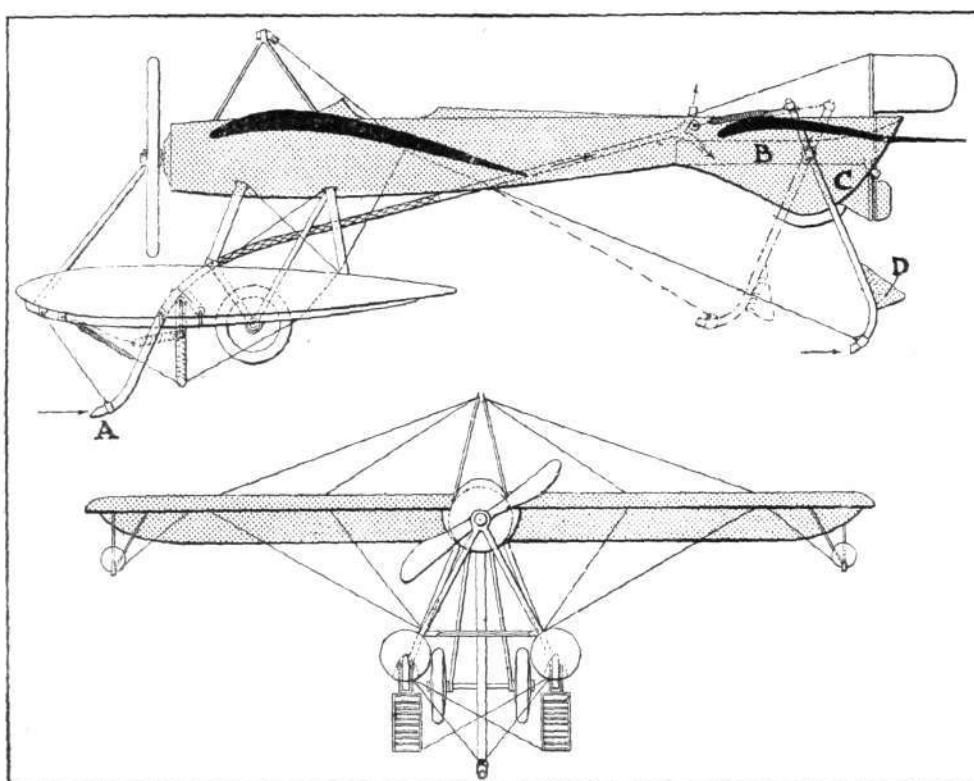


Fig. 7.—Messrs. Short Bros.' system—combined hydrovanes and floats.

or less flexible connections. This type of float is placed one in front and two behind (Voisin Canard), or two in front and one behind (original Caudron). Reference has already been made to floats of the catamaran type; these are generally arranged in pairs, are usually rectangular in shape with curved bows and sterns, generally their bows are more or less turned up and pointed, but some are merely rounded off. The former is undoubtedly the better plan, especially when for use on rough water owing to their cutting through the waves the more easily. In flight the head resistance of this type of float is small and they also get off the water under favourable conditions fairly quickly. Being in apteroid (end on) aspect they are not so efficient as the Fabre type, either as hydroplanes or aeroplane surfaces.

The speed at which "skimming" over the surface of the water commences, increases with the length of the float, but before skimming can commence, it is necessary that the machine travels over the surface of the water at a certain high velocity, and it is easier to drive through the water a vessel, or hull, end on, than broadside. As a matter of fact with the same relative power of say 1-h.p. to 20 kilograms, a vessel 12 metres long is more rapid



than one of 6 metres. Supposing then that we are relying for our "get off" more on the aeroplanic than on the hydroplanic principle, it may be advantageous to adopt a single float of a more boat-like character, as has been done (under favourable conditions) with such success in the case of the Donnet-Leveque machine in France and the last type Curtiss in America. In such a type the single float is always in the centre, and they almost invariably have small floats, "balancers" at or near the wing tips for lateral balance.

In the case of both the 2nd and 3rd type the bottom of the float is very often provided with one or more steps in order to facilitate skimming on the surface of the water. The principle of the stepped float is that the frictional resistance depends on the body immersed being wetted by the fluid, it therefore follows that if any means can be devised by which the body is no longer wetted or even if we can reduce the extent of the wetted surface, the frictional resistance will be reduced. The accomplishment of this

joggle or step is ormed in the bottom of the vessel where the fore and aft part meet. In Fig. 9, E denotes the engine, F the propeller shaft, G the bracket supporting the latter, H the propeller, J the designed line of flotation when the vessel is at rest, D the

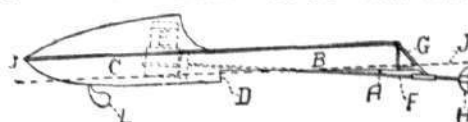


Fig. 9.—Stepped hydroplane.

step or joggle, L the rudder. When such a vessel is driven through the water at a high rate of speed, air is drawn in between the surface of the water and the bottom A, and remains there in the form of a film of air which serves to support the afterpart of the

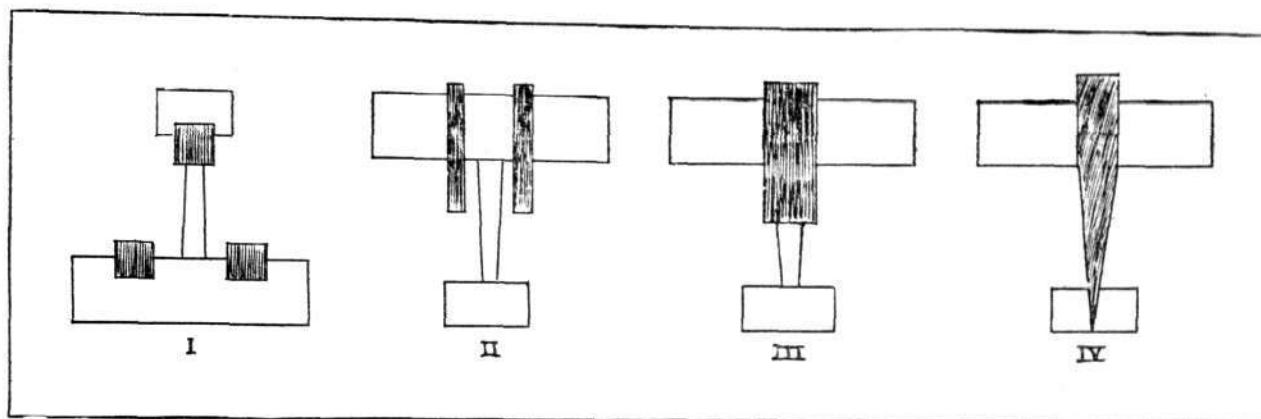


Fig. 8.—Float disposition. (i) Three floats, short and square. (ii) Two long floats, catamaran type. (iii) One long central float. (iv) fuselage-coque.

was the purpose for which Mr. A. E. Knight took out Patent No. 1760, 1906. The main principle in this invention is that the bottom of the after part of the body is for some considerable portion of its length in a different and higher longitudinal plane to that of the bottom of the fore part, the bottom of the after part preferably inclining in a downward direction towards the end, and a distinct

vessel and keep the same out of actual contact with the water. We thus have a diminished resistance, the friction for the afterpart now being air-air instead of water-water; whilst owing to the principles of the hydroplane the actual surface in the water is considerably lessened.

(To be continued.)

## AIRSHIP NEWS.

### The "Gamma" Visits London.

Manned by a naval crew, with Commander E. A. Masterman in command and Lieut. N. F. Osborne as pilot, the Army airship "Gamma" cruised on Wednesday morning from Farnborough to London. The airship turned above the Chelsea football ground and arrived back at Farnborough just in time to avoid a heavy storm of sleet and snow.

### The "Fleurus" Above Paris.

THE dirigible "Fleurus," constructed at the Military works at Chalais-Meudon, paid a visit to Paris on the afternoon of the 10th inst. and cruised over the city and the Versailles district for some time. During part of the trip a Nieuport monoplane from Villacoublay manoeuvred round the airship.

### A New Clement-Bayard Airship.

THE latest Clement-Bayard airship, which should be out on trial during the first fortnight in February, is to be known as C.B.V. bis. The envelope is of 9,660 cubic metres capacity and the speed of the vessel is to be 75 k.p.h. The airship is destined for Russia and another similar craft for the same country is under construction.

### An Airship Station at Heligoland.

ACCORDING to advices from Berlin, one of the naval airship stations is to be on the island of Heligoland, and it will be of a somewhat unique character. The revolving airship shed is to be built in a hollow, and will be so arranged that it can be raised in order to allow the airship to leave or to re-enter.

### New Zeppelins for German Army.

OF the three Zeppelin cruisers ordered by the German War Office, one is nearly ready to commence its trials and another should be ready about the end of next month. The work is being pushed on rapidly, and 60 more workmen were engaged on January 1st, making the total number employed at the Zeppelin works 230. It is stated that a fourth military Zeppelin will be ordered during this year.

### German Naval Minister in Dirigible.

ON the 4th inst. the German Naval Minister, Admiral von Tirpitz, enjoyed for the first time a lengthy trip in the air, the experience being made on the Navy's Zeppelin L1.

### Another Mishap with "Schutte-Lanz."

THE wooden frame rigid dirigible "Schutte-Lanz" was returning to Biesdorf on Saturday after a cruise over Potsdam, &c., when one of the vertical rudders broke. The Commander thereupon brought the airship down on some open ground at Mahlsdorf, but a gust of wind caught the vessel and carried the tail end on to the roof of a house. Considerable damage was done to both the house and the airship, but the latter was got back to its shed later in the day. With the exception of one man, who jumped from a height of 30 ft., and broke an arm and a leg, the crew of twelve men and two officers escaped unhurt.

### High Balloon Ascent and Wireless.

AT Bitterfeld, on the 8th inst., some tests were carried out in sending wireless telegrams from balloons. Two aeronauts went up in a balloon to a height of 7,500 metres and succeeded in transmitting several messages.

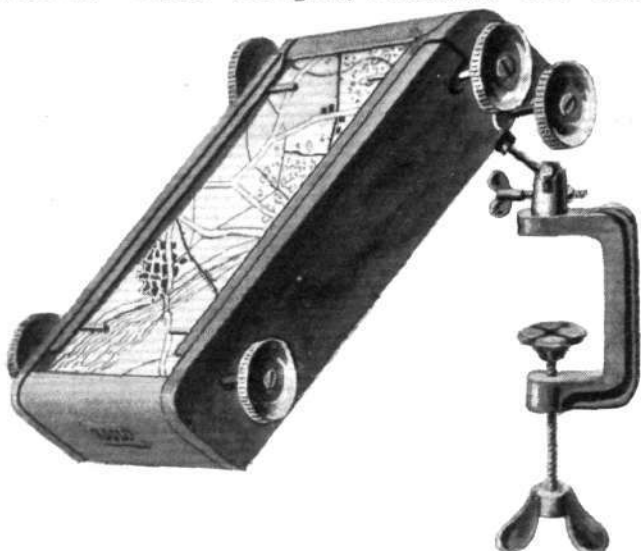
### Meeting of the F.A.I.

AT the special meeting of the Fédération Aéronautique Internationale, to be held in Paris on January 28th, the matters to be discussed include (1) the establishment of a *brevet* for hydro-aeroplanes, (2) the affiliation of the Aero Club of Portugal, (3) protest of the Ae.C.F. against the award to Renaux at the Tamise meeting, (4) regulations for the International Cup for marine aviation, (5) creation of an *aéronautique triptyque*, (6) an aeronautic calendar for 1913.

In the morning the special committee for the Gordon-Bennett aviation trophy will meet to finally draw up the regulations. It will be remembered that at the last meeting, in Vienna, it was decided that the course should be a cross-country one of 200 kiloms.

## ACCESSORIES FOR THE AVIATOR.

WE have received from the General Aviation Contractors, Ltd., a proof of a very interesting catalogue they are about to issue. It sets forth the main characteristics of the many useful accessories relative to the proper clothing of the pilot, that Messrs. Roold, of Paris, for whom the "G.A.C." are agents, manufacture. The "Roold"

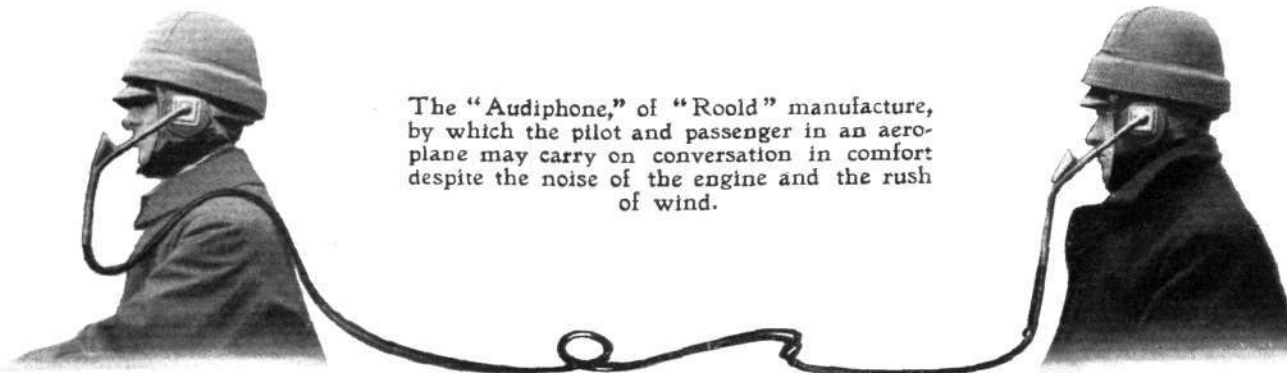


The "Roold" map case, which is interesting in that it may be lengthened, by turning a thumbscrew, to twice size indicated in the photograph, thus showing a larger section of the map.

safety helmet is one which is, perhaps, the best known in France. Over here in England, too, it is just as popular. Its construction is rather interesting. It has two strong shells made from a composition of cork and rubber, and between them metallic wool is packed. Outside it is covered with a washable material, so that it can always

helmet, there can be not the slightest doubt. Many have been the accidents in which the life of the pilot has been saved by his helmet. It is curious, but nevertheless a fact, while on this point, that pilots in the past have had a dislike to wearing helmets. Perhaps it is that people who run risks never like to be reminded of them. Perhaps they disliked the helmet as being rather too conspicuous. That may be, but, after all, it is wiser to be prepared. The writer remembers an incident which has some bearing on this point. At the Bournemouth aviation meeting in 1910, Morane's friends, just before he started out on his flight round the Needles, were trying to get him to wear a helmet. He said he didn't like to—he preferred his check cap. No one else was wearing one—why should he? So his friends went to Christiaens and, after much prevailing, at last got him to consent to wear one, so that they could point him out to Morane and get the last named pilot to wear his. Whether Morane did put his on or not the writer doesn't remember. But it was lucky Christiaens did, because soon after, flying with a passenger on his machine, he came down heavily on rough ground and was hurt. There was a nasty gash in his helmet. He can buy a new helmet, but he couldn't have bought a new head. Christiaens had cause to be thankful to Morane's friends. But to come back to the catalogue. A page or two further on, flying suits are illustrated—seventeen different styles in all—from suits of cat skin, suits of that thin shiny material, *Papier du Japon*, which Vedrines and Bielovucic wear, to the ordinary blue cotton boiler suits for mechanics. Quite an innovation are the chest and leg protectors that are made on the same principle as the helmets, and which are worn to prevent broken bones. There is also listed a special form of aeroplane seat of a similar character. Of goggles there is a large selection and one model, which brands the list as being well up-to-date, is specially devised for hydro-aeroplane work. It is fitted with a special shield which prevents the glasses from becoming splashed.

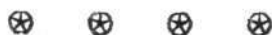
Then there are map cases, gloves, boots, mufflers and all manner of things listed which will be of undoubted interest to the flying man, especially during this cold weather. Lastly, for £3 12s. 6d., the passenger carrier can buy an "Audiphone," which he can attach to his and his passenger's helmet and, with it, carry on conversation in comfort, undisturbed by the noise of the motor.



The "Audiphone," of "Roold" manufacture, by which the pilot and passenger in an aeroplane may carry on conversation in comfort despite the noise of the engine and the rush of wind.

be brought back to a presentable appearance if it becomes soiled; inside it is carefully padded so that the helmet shall rest comfortably on the head. They are supplied now with a neck extension if required, and with a peak. Regarding the utility of the safety

Altogether, the list is quite interesting and many pilots will, without question, see in its pages something they may fancy. The General Aviation Contractors, Ltd., will, undoubtedly, be pleased to send a copy to anyone interested.



## AERONAUTICAL SOCIETY OF GREAT BRITAIN.

### Official Notices.

**Elections.**—Member: A Gordon Bond. Students: Reginald Alston, Maurice Davidson, E. J. Lowe, J. T. Morton, A. Camden Pratt, and T. C. Thrupp.

**Meetings.**—The fifth meeting of the Society for the present session will be held on Wednesday, January 29th, at 8.30 p.m., when Brigadier-General D. Henderson, D.S.O., C.B., will preside. Mr. Mervyn O'Gorman, M.I.M.E., A.F.Ae.S., will read a paper, followed by a discussion, on "Stability Devices for Aeroplanes."

The sixth meeting will be held on Wednesday, February 12th, when Sir William White, K.C.B., F.R.S., will preside. Mr. L. Bairstow, A.R.C.Sc., will read a paper on "The Law of Similarity connecting Models and Full-sized Machines."

**Council Election.**—Members are reminded that under the rules nominations of candidates for election to the Council must be received by the Secretary not later than 5th March, signed by two

voters and no more, with an intimation in writing by the nominees that they are willing to serve.

**Fund for Mrs. Hardwick.**—The Council hope that members will subscribe to the fund which has been opened for the widow of their late fellow member, Mr. A. Arkell Hardwick. Subscriptions may be sent to the officers of the Society.

**Associate Fellowship Election.**—Application forms for the next election of Associate Fellows, which will take place in March, can now be obtained from the Secretary, and it should be noted that it is not necessary that the applicants should be members of the Society.

**Lectures.**—In accordance with the educational policy of the Society lectures to various working men's clubs on the "Theory and Practice of Aviation" are being given by the Secretary.

BERTRAM G. COOPER, Secretary.



# AERONAUTICAL ENGINES.

Paper read by A. GRAHAM CLARK before the Institution of Automobile Engineers.

(Continued from page 75.)

The 60-h.p. Hall Scott Motor is seen in Figs. 14 and 15, but there are two other engines rated at 40 and 80-h.p. respectively. In all of them detachable heads are fitted to the cylinders, and these are held in position by five long bolts passed through from the interior of the crank-case, as shown, the joint being made by a copper asbestos gasket. A separate pipe is fitted to connect up the jacket round the cylinder

engines, however, it has been employed for over three years, and its continued use is evidence that no serious trouble is experienced.

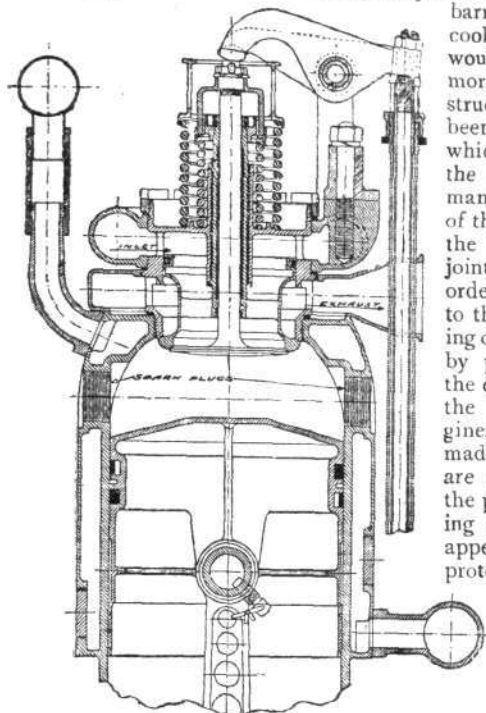


Fig. 13.—Section of Kirkham Engine.

barrel with the water-cooled heads. It would seem that a more satisfactory construction could have been devised than one which entails draining the jackets, the dismantling of the whole of the valve gear and the breaking of the joint in the head in order to gain access to the valves. Cooling of the oil is effected by passing it round the carburettor, as in the Maximotor engines. All parts not made of aluminium are nickel plated for the purpose of obtaining a clean finished appearance and for protection against atmospheric influences. It is claimed that these engines are very flexible, and that aviators in the United States

use more of this make than of any other. This firm also produces special lightweight radiators, weighing only 12, 21 and 36 lbs. for engines of 40, 60 and 80-h.p. respectively.

**Kirkham Engines.**—One of the features of these engines is the concentric inlet and exhaust valves shown in Fig. 13, from which the method of operation will be apparent. Such a construction

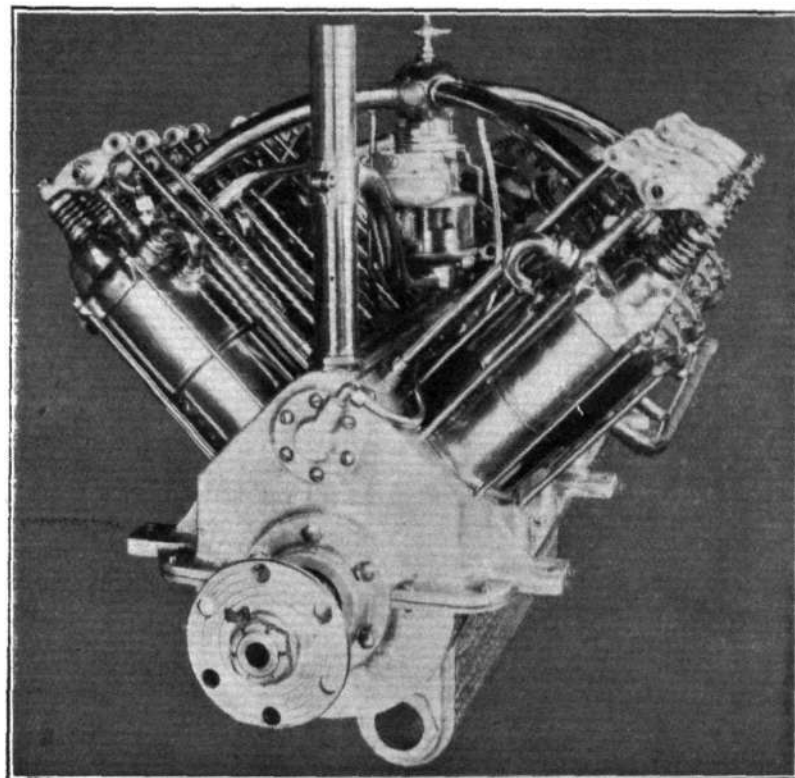


Fig. 14.—60-h.p. Hall Scott Engine

Oil-cooling is provided for by the fitting of two finned copper tubes through the oil reservoir in the bottom of the crank-case. There is another model manufactured by this company in addi-

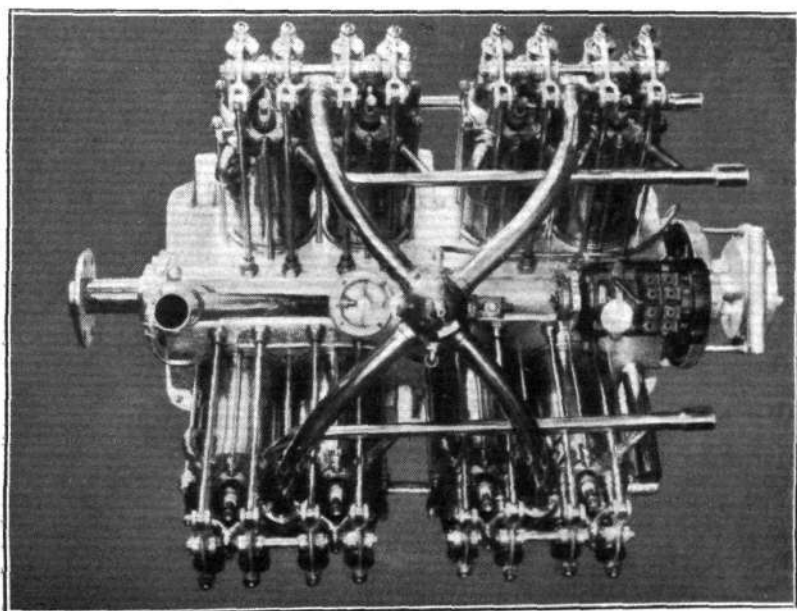


Fig. 15.—60-h.p. Hall Scott Engine.

allows of some small reduction in weight and enables a rather higher volumetric efficiency to be attained, while the passage of the fresh mixture into the cylinder tends to cool the exhaust valve. The system has been tried on various continental motors, but has generally been abandoned on account of overheating. In these

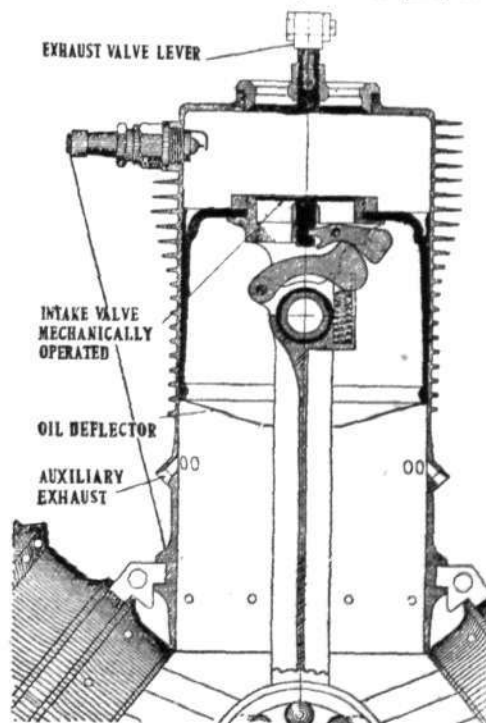


Fig. 16.—Valves of Gyro Motor.

tion to those enumerated in the table, namely, a six-cylinder water-cooled vertical engine  $4\frac{1}{8}$  in. by  $5\frac{1}{2}$  in. giving 76.3 b.h.p. at 1,680 revolutions per minute, and weighing 285 lb. This is fitted with a 4 to 7 ball bearing reducing gear, so that the propeller speed is 960 revs. per minute. (To be continued.)

# BRITISH NOTES OF THE WEEK.

## ROYAL FLYING CORPS.

THE following appointments were announced in the *London Gazette* of the 17th inst. :—

**Royal Flying Corps. Military Wing.**—The undermentioned to be flying officers and to be seconded :—Brevet Major Lionel B. Moss, the South Staffordshire Regiment. Dated October 24th, 1912. Capt. the Hon. Claude M. P. Brabazon, Irish Guards. Dated December 5th, 1912.

The following appointments were announced in the *London Gazette* of the 21st inst. :—

**Royal Flying Corps.—Military Wing.**—The undermentioned are appointed flying officers, and to be seconded : Lieut. Philip L. W. Herbert, Sherwood Foresters (Notts and Derby Regt.). Dated October 25th, 1912. Lieut. Gordon S. Shephard, Royal Fusiliers (City of London Regt.). Dated November 28th, 1912. Second Lieut. Patrick H. L. Playfair Royal Artillery. Dated November 28th, 1912. The undermentioned are appointed to the Reserve, dated January 22nd, 1913 :—Major Edward B. Ashmore, M.V.O., Royal Artillery; and Lieut. Stephen C. W. Smith, 3rd Batt. East Surrey Regt.

### The Hardwick Fund.

THE following list of subscribers is to hand from Messrs. Handley Page, Ltd., 72, Victoria Street, S.W., to whom any further sums should be sent for Mrs. Hardwick :—

Handley Page, Ltd., £52 10s.; W. Dunkels, £25; Sir Hugh Fort, £25; Anonymous, £25; Trevor Handley, £10 10s.; A. S. Marks, £10; Rev. A. W. Parke, £10; F. Handley Page, £10; E. Oppenheimer, £5 5s.; Charles Parke, Mrs. Foster, Mrs. Dunkels, Anonymous (£5 each); E. Thal, £3 3s.; Miss M. Dunkels, F. W. Green, B. Kitzinger, R. A. Wall (£2 2s. each); O. W. Thomas, £2; B.T., Miss Buill, F. S. Davis, H. Politzer, George L. Handley, Bosch Magneto Co., Anonymous, Anonymous, E. Hayman, J. D. Higgins, R. Forbes-Bentley (£1 1s. each); Miss Manning, T. O'B. Hubbard, Paul Pourcy, — Williams, Anonymous, H. Turrill, W. L. Trant Brown (10s. 6d. each); Miss Constance Caws, 10s.; Madame Petitpierre, 6s.; A Widow, 5s.; Anonymous, 2s. 6d.

### Protecting Explosives from Aircraft.

EVIDENTLY the Admiralty officials realise that aircraft, as fighting units, will be a serious menace in future warfare, as the new naval magazines at Portsmouth for the storage of high explosives are being completely protected against bomb dropping, &c. Situated at Bedenham, an isolated spot in the upper reaches of the harbour, the magazines consist of a number of sunken ferro-concrete chambers, which are covered in completely with about four feet of solid earth and turfed to hide their identity from above. Such precautions for the adequate protection of high explosives stored in large quantities is a step in the right direction, as an attack by aircraft on magazines of the old type would be disastrous.

### A Flying Ground for Dublin.

ARRANGEMENTS are now well in hand for the laying out of a flying ground at Kimmage, in the neighbourhood of Dublin. The piece of land is about 250 yards long by a little over 200 yards wide and is perfectly level, while the surrounding country is good from a flying point of view. Its one drawback appears to be its smallness. Messrs. M. J. Mullins and T. J. Rea, of the Dublin Aviation School, who have the matter in hand, intend to form a small com-

pany, and besides establishing a school will arrange flying meetings from time to time.

### A Correction.

IN Mr. Hume-Rothery's article on negative wing tips, which appeared last week, the word "zero" was omitted from a paragraph near the bottom of the second column. The paragraph in question should properly read, "In Prof. Bryan's language, the resistance derivatives  $L_q$  and  $M_p$  may both be made zero."

### Cantor Lectures on Aeronautics.

ARRANGEMENTS have been made by the Royal Society of Arts for a series of three Cantor Lectures to be given by Prof. Petavel, M.Sc., F.R.S., on the subject of aeronautics. The dates of the lectures are March 31st, April 7th and 14th.

### New Pupils at Central Flying School.

A LARGE number of pupils having finished their course at the Central Flying School, Upavon, another dozen naval officers detailed for flying instruction were transferred from H.M.S. "Actæon," parent ship of the R.F.C. naval wing, to the Central Flying School on the 17th inst. The officers are Lieuts. H. D. Vernon, D. A. Oliver, R. P. Ross and J. R. B. Kennedy, Sub-Lieut. J. T. Babington and Assistant-Paymaster E. B. Parker, R.N., Lieut. F. W. Bowhill and Sub-Lieut. A. W. Bigsworth, R.N.R., Lieuts. C. E. Rathbone and T. S. Creswell, R.M.L.I., and Acting Sub-Lieuts. R. L. G. Marix and H. A. Littleton, of the R.N.V.R. Several of them have already learnt to fly at the Bristol School on Salisbury Plain.

### Naval Air Station at Dover.

IT appears that the visits of the naval aviators to Dover have been in the nature of prospecting expeditions, and the Admiralty are now negotiating with the proprietors of the aerodrome with a view to utilising it as a base of the naval wing of the R.F.C.

### The Military Station at Montrose.

FOR several reasons the proposed transference of the B.E. and Maurice Farman flights of No. 2 squadron R.F.C. from South Farnborough to the new station at Montrose which was to have been made on Tuesday had to be postponed. The weather has been against long distance flying and the Panmure barracks, which are to be utilized at Montrose, are not yet ready for occupation. For the flying ground the military authorities are negotiating for the purchase of a large piece of ground at Upper Dysart.

### A Lecture at Northampton.

ON Wednesday of last week the members of the Northampton Highest Ideal Society had the pleasure of hearing a very interesting lecture by Major B. Baden Powell on the Progress of Aerial Navigation. As indicated by the title the lecture was mainly historical, but Major Baden Powell also explained the various parts of a modern aeroplane and pointed out the possible spheres of usefulness of such craft.

### An Aeroplane Shed at Sandgate.

A SCHEME is being considered for the erection of a workshop for the repair of aeroplanes near the old lifeboat house by Sandgate (Kent) Station. It would stand on War Office property, although it would be under private control, and as at this point the beach is practically level with the road, it could easily be reached from the sea and be available for hydro-aeroplanes.

## FOREIGN AVIATION NEWS.

### Notable Passengers at Buc.

AMONG a large number of passengers taken by Etienne Giraud on his new Blériot touring aeroplane at Buc on the 14th inst. was Mme. Hinot, sister-in-law of M. Blériot, and afterwards Commandant Hinot, a director of the Blériot firm, was taken for a spin over St. Cyr, Satory and Versailles.

### A Farman Superior Pilot.

OVER a course from Buc to Chartres and Orleans and back, Sergeant Carrus carried out his second test for a superior brevet on the 15th inst. During the greater part of the trip he kept his Maurice Farman machine at an altitude of 900 metres.

### A Change for Martinet.

THE well-known pilot Martinet has been appointed to take charge of the Doutré school which is being established at Corbeaulieu.

### A Caudron for China.

RENE CAUDRON was testing at Crotoy on the 15th inst. a 50-h.p. Caudron, ordered by the Chinese military authorities. An

altitude of 1,000 metres was attained in ten mins., and the speed was 105 k.p.h.

### Fine Work on a Caudron.

LIEUT. GERARD started from Crotoy on his 50-h.p. Caudron on the 15th inst., and after flying for an hour and a half at a height of 2,500 metres, landed at the Caudron ground at Rue.

### Marine 'Buses for the Riviera.

THE Compagnie Generale Transaerienne has ordered from the Astra Co. four 100-h.p. hydro-aeroplanes, which are to be used for passenger trips from Nice to Monte Carlo and Cannes. The first one is to be delivered very shortly.

### A New Monoplane.

RENE SIMON and Bathiat have been collaborating in the production of a new monoplane which is shortly to make its appearance. Simon has just gone to Rheims to serve his year with the Army as a flying officer, and pending the arrival of his Bathiat-Simon machine he will fly a Deperdussin.



### Resignation of Weymann.

IT is reported that Weymann, the winner of the Gordon-Bennett in 1911, and also the winner of the first place in the French military competition, has resigned from the Board of Directors of the Société Nieuport.

### A Clement-Bayard Superior Pilot.

FOR the second test for his military *brevet*, Gastinger on a Clement-Bayard steel monoplane, flew over a course from Issy to Chartres, Blois, and Orleans on Saturday last.

### Issy to Mourmelon on a Voisin.

RUGERE, on Saturday, flew over from Issy to Mourmelon on his Voisin biplane in good time.

### Testing a Rhone-Blériot.

ON a single-seater military Blériot, fitted with a 60-h.p. Rhone motor, Perreyon, at Buc on Saturday, climbed 700 metres in 7 mins., and at a subsequent test rose 2,000 metres in 35 mins.

### Good Work at Hanriot School.

PONNIER made a flight of an hour on a 50-h.p. Hanriot at Rheims on Saturday while Favre went over the town on a 100-h.p. three seater. On Monday, Favre and Raulet each made a trip of half-an-hour on a Hanriot with Rossel-Peugeot motor.

### For the Latham Memorial.

CONTINUING her series of lectures, Mdlle. Marvingt visited Calais on Monday week, but instead of being given, as usual, to the fund for the purchase of military aeroplanes, the proceeds are to be devoted to the Latham Memorial Fund at Calais.

### Flying on Farmans at Rheims.

SOME fine flying on Farman biplanes was seen at Rheims on Saturday. On a 80-h.p. machine Lieut. Vigne made a trip of over an hour's duration, Sapper Foulquier was up at 1,200 metres for some time, and Lieuts. Germain and Menard made long reconnoitring flights over the surrounding country.

### Chevillard Flies in a Squall.

WITH a very squally wind blowing over 25 m.p.h. at times, Chevillard on Monday went over from Buc to Etampes in 32 mins. on one of the small Henry Farman biplanes.

### The Proposed Trans-Alpine Flight.

AT the time of writing Bielovucic is still at Brigne waiting for calm weather so that he can make his trip through the Simplon Pass. The slight damage sustained by the Hanriot monoplane when landing after a trial flight on the 14th inst., has been repaired and the machine is already. Bielovucic has declared that he will not start unless the weather is exceptionally good, which is a lot to hope for at this time of the year.

### Two Frenchmen Honoured.

MM. EMILE DUBONNET and Rene Gasnier, both of whom have accomplished noteworthy performances on aeroplanes and balloons and have been very active in connection with aeronautics in France, have been decorated by the Minister of Public Works with the Legion of Honour.

### Rheims to Verviers and Back.

ON the 14th, Vedrines and Janoir, both on Deperdussins, flew in company from Rheims to Verviers, and after partaking of refreshments returned to the Deperdussin headquarters at Betheny, near Rheims.

### Aeroplanes Over Presidential Election.

WHILE the ceremonies in connection with the election of the new French President were proceeding at Versailles on the 17th inst., a Farman biplane and Blériot and Deperdussin monoplanes flew over the palace, the Blériot being piloted by Perreyon.

### The Upper Rhine Circuit.

FOLLOWING the example of Wiesbaden, the town of Cassel has offered £500 towards the prize fund of the Upper Rhine Circuit and in consequence the route has been revised to take in Cassel.

### Donnet-Leveques in Austria.

FOUR Austrian officers, Lieuts. Klobuchar, Woffencek, Penfield and Ingfried, each on a Donnet-Leveque flying boat, flew in company from the military station at Pola to Fiume, a distance of 130 kiloms. Two machines had 50-h.p. Gnome motors and the other two 80-h.p. Gnomes, and the latter machines carried passengers.

### New Italian Height Record.

ON the 17th inst., at Aniano, Lieut. de Carolis improved on the Italian height record, taking it up to 2,500 metres. He was using a 70-h.p. Gnome-Blériot.

### Flying Over the Adriatic.

ON a Blériot with 80-h.p. Gnome motor, Capt. Luca Bongiovanni, on Saturday, flew from Aviano to Venice and back at a height of 2,000 metres.

### Deperdussins in Morocco.

HALF a dozen Deperdussin monoplanes—two two-seaters and four single-seaters—have now arrived at the French military station at Oudjda, and Lieuts. Magnien, Jannerod, Bruncher, and Soulsia land have been nominated to pilot them.

### Paris to Morocco Flight.

Helen, the Nieuport pilot, is making a tour over the route he proposes to follow in his projected flight from Paris to Casablanca. His present scheme is to complete the trip in three stages: the first from Paris by Lyon and Montpellier to Perpignan; the second by Barcelona, Tortosa, Valencia to Alicante; and the final by way of Malaga and Algeciras, then across the straits of Gibraltar to Tangier, and so on to Casablanca. The total distance is about 2,800 kiloms.

### A Fatality in Argentina.

WHILE taking part in a race from Buenos Ayres to Mar del Plata, Lieut. Origone's monoplane fell from a height of 1,000 metres near Brandzen and the pilot was killed. The other two competitors, Corporal Fels and Lubbe, each completed the course, but the latter had to stop *en route*. The winner was Corporal Fels, on a Blériot, while Lubbe is said to have been using a Rumpler monoplane.



## KITE AND MODEL AEROPLANE ASSOCIATION.

### Official Notices.

#### British Model Records.

Hand-launched ...	Distance ...	A. E. Woollard ...	477 yards.
	Duration ...	A. F. Houlberg ...	89 secs.
Off ground ...	Distance ...	G. Rowlands ...	232 yards.
	Duration ...	A. F. Houlberg ...	51 secs.
Hydro, off ground ...	Duration ...	G. P. Bragg-Smith ...	25 secs.
Single-tractor screw, hand-launched ...	Distance ...	F. G. Hindsley ...	173 yards.
	Duration ...	F. G. Hindsley ...	36 secs.
Do., off ground ...	Duration ...	H. R. Weston ...	21 secs.

**Official Trials.**—On Saturday, January 18th, the official observers attended the ground of the Aero Models (Northern Branch), at East Finchley, for the purpose of observing flights for distance and duration for registration and establishing records. The observers were Messrs. C. Davies, M. B. Ross, and W. H. Akehurst. The results were:—

Duration, hand-launched: J. McBurnie, 39 secs.; J. E. Louch, 35 secs.  
Single tractor screw, hand-launched, duration: F. G. Hindsley, 36 secs.; H. Weston, 30 secs.  
Single tractor screw, hand-launched, distance: F. G. Hindsley, 173 yards.  
Single tractor screw, off-ground, duration: H. R. Weston, 21 secs.  
Distance, off-ground: A. F. Houlberg, 176 yards.

As will be seen, both the tractor records have been beaten by Mr. Hindsley of the Aero Models Association, also a new record was set up by Mr. Weston with his tractor off ground. He is a member of both the parent body and the Aero Models Association. It is pleasing to see that as the observers visit the various clubs the records are beaten by members of that club.

The next trials will be held in March, there being no February trials on account of the Aero Exhibition. Any club wishing for next trials to take place on their ground should apply at once.

**Affiliation.**—The application of the Bristol and West of England Aero Club to be affiliated was accepted by the Council on Thursday, 16th inst.

**Official Observers.**—For the Bristol and West of England district Messrs. R. M. Haines, P. A. Thompson, A.M.I.C.E., R. V. Tivy and E. Vessey have been appointed official observers.

**Ground for Flying Tests in Connection with Aero Exhibition, Olympia.**—A sub-committee was appointed to inspect grounds and water round London, and to decide upon the most suitable, and fix date; the committee appointed being Messrs. R. M. Balston and H. Perrin on behalf of The Royal Aero Club, and Messrs. G. P. Bragg-Smith and W. H. Akehurst on behalf of the Association. The date and place will be published in next issue.

**New Members.**—Among the members elected on the 16th were, Maj.-Gen. Ruck, R.E., Commander P. Garrett, R.N., Messrs. D. Stanger, N. R. Gordon, C. Desoutter, H. H. Groves, and N. V. Brasnett.

**Aero Exhibition, Olympia.**—Members and friends are not sending in their applications for space as requested. They are requested to do so at once if suitable space is to be reserved.

27, Victory Road, Wimbledon, S.W. W. H. AKEHURST, Hon. Sec.



## MODEL CLUB DIARY AND REPORTS.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

### Aero-Models Assoc. (N. Branch) (15, HIGHGATE AVENUE, N.).

JANUARY 25TH. Flying as usual at Finchley, 3 p.m. All members entering models on the Club Stand at Olympia are requested to forward full particulars of their machines to the secretary, not later than Thursday next, 30th inst. Cards, official numbers to be displayed with machines, and free passes for the Exhibition will be issued in due course.

### Paddington and Districts (77, SWINDERS ROAD, WEMBLEY).

JANUARY 25TH. Members visit to the South Kensington Museum (Aeronautical Section). Meet at Westbourne Park Station, 4 p.m. Anyone interested is invited to join the party.

### Sheffield Model Aero Club (35, PENRHYN ROAD, SHEFFIELD).

JANUARY 25TH. Weather permitting, all members are requested to be at Standhoue aerodrome, 3 p.m. prompt. Flying will continue every Saturday at the above aerodrome until further notice.

### S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).

JANUARY 25th-26th. Members will meet during the week-end at Kidbrooke, Blackheath, Lee, and on the Cricket Ground, Chislehurst. Times as published in FLIGHT last week.

# Models

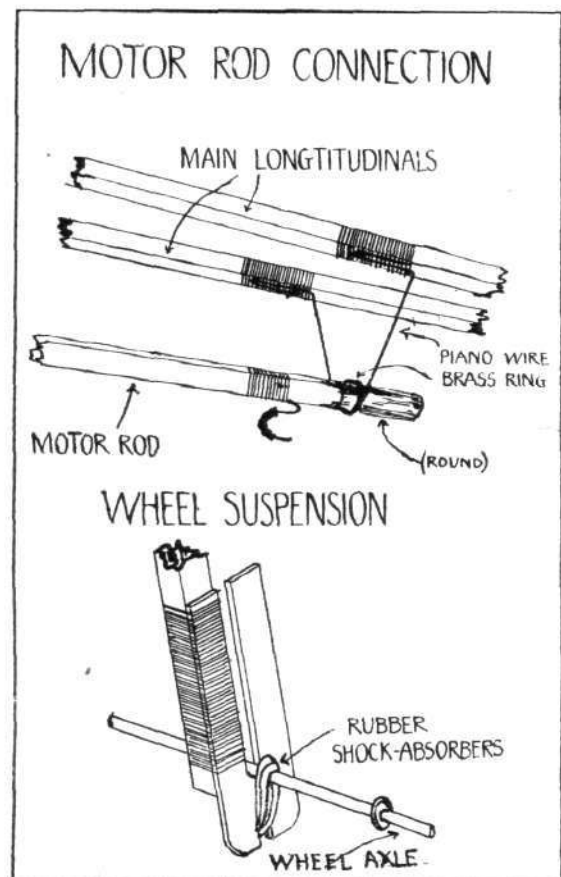
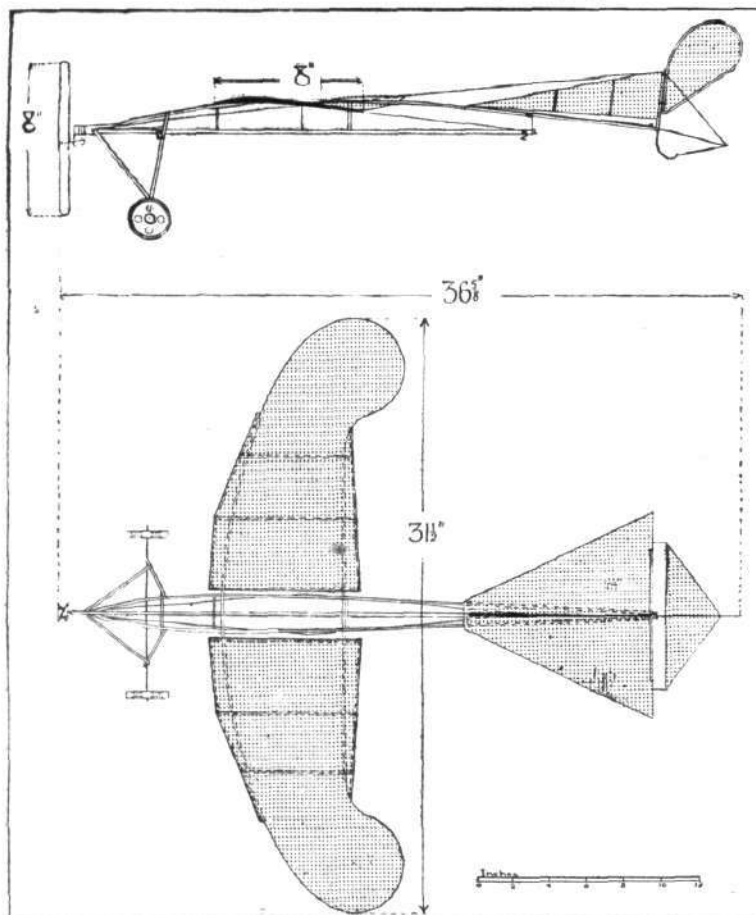
Edited by V. E. JOHNSON, M.A.

## A Device for Overcoming Motor Torque on Models with One Propeller.

MR. ARTHUR P. PETRIE (Rochdale) sends the following account (accompanied with scale drawings) of a self-rising tractor monoplane, constructed by him last November, the particular feature of which was the device employed for overcoming the undesirable deformation of the tail caused by the torque of the single skein rubber motor. The device is specially intended for use with monoplanes, because in the case of biplanes it is a fairly easy matter to sever all connections between the rear half of the motor and the elevator of the machine, but with monoplanes constructional difficulties present themselves, and weight is prohibitive of a large amount of framework. In this model the motor rod is rigidly connected to the body carrying the

12 sq. ins.; loading,  $2\frac{1}{2}$  oz. per sq. ft. approx.; the two main longitudinals forming the body are pine,  $\frac{1}{8}$  in. sq. section; the motor rod is  $\frac{1}{8}$  in.  $\times$   $\frac{1}{8}$  in. pine; the main plane is double surfaced save the tips; it is covered with silk chiffon made air-proof with Bragg-Smith varnish; the tractor screw is birch, carved from the solid, it is 8 ins. in diam. and has a pitch of 12.57 ins.; the wheels,  $2\frac{1}{4}$  ins. in diameter, are turned from baywood and weigh  $\frac{1}{2}$  oz. the pair.

The idea of severing, as far as possible, all connections between the one end of the motor rod and the tail or elevator part of the machine, i.e., connecting these two by separate longitudinal members apart altogether from the rod carrying the motor, is an excellent one, but it is by no means new. It was used for instance, if we



Mr. A. P. Petrie's model.

wings, tail, &c., at three places. One of these is right in the prow of the machine, one by means of strut at a point level with the leading edge of the wings, and the other by means of struts at a point level with the trailing edge of the wings. The rear end of the motor rod is fastened to the body, as shown in one of the sketches. The end of the rod is made round, and fits loosely in a brass ring soldered to two piano wire struts. When the rear end of the rod becomes twisted by the torque of the rubber, it is thereby allowed to slip round in the ring without having any twisting effect whatever on the tail. As a result the model tends to fly much straighter, and experiments can therefore be more satisfactorily carried out. The method does not present any great constructional difficulties, and is neither heavy nor clumsy in appearance. Another small advantage is that it offers a good opportunity for making the body streamline in form. Some other special points about the machine are (1) the wheel mounting, (2) the large wing surface, (3) the upturned wing tips which, to all appearances, greatly increase the stability, especially in a slow-flying model. The chief particulars of the machine are: Total weight in flying order,  $3\frac{3}{4}$  ozs.; weight of rubber, 12 strands,  $\frac{1}{8}$  in. sq. section,  $\frac{1}{2}$  oz.; approx. area of main plane, 178 sq. ins.; of the tail 55 sq. in.; area of elevator

remember correctly, in the Bragg-Smith model, in the machine first entered for public competition. The introduction of machines with twin-propellers, of course, did away with the difficulty and the necessity of employing any such device, and the advantages of twin propellers in open competitions was so obvious, that the model with the single propeller became almost a rarity. Nevertheless it is by far the most interesting, and (as models with twin propellers are usually built) sometimes the more scientific of the two.

Mr. Petrie says in his communication that the best flight he has had is 215 ft., and best duration 12 secs. Not a good performance, as he himself says, but the model owing to unfavourable weather conditions, and lack of time, has not undergone any very thorough tests as to its capabilities.

As we have previously pointed out, the torque of the rubber motor in causing deformation in the framework can be entirely overcome by employing two rubber motors of equal weight, symmetrically arranged, and geared together by two small and light cogwheels of the same number of teeth, the axle of one of the cogs being also the axle of the propeller. The rubber motor can in such a case be run the whole length of the fuselage, and many more turns be given to the rubber. More than two years ago we obtained 52 secs. with



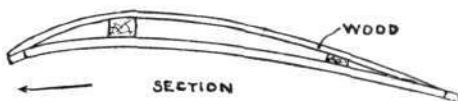
such a model, Canard type, but it can be applied to the tractor type model equally as well. Suitable cogwheels can be obtained of Messrs. J. Bonn and Co.

#### Mr. C. J. Temperley's Query.

Mr. Temperley, in writing to thank those who have so kindly replied to his query says, "unfortunately, I have been unable to do much model-making lately, and have not thus made any experiments in that direction myself. I have, however, a few measurements of a biplane—P. O. 2.1. r.o.g. type. It does not, however, rise off (the) ground except with a little push, and only flies 50 yards, as the great quantity of rubber will hardly stand more than 300 turns, if that. It has a four-bladed home-made aluminium propeller (tractor) and a double ball-bearing bracket with two hooks for the two skeins of rubber. The tail has a slight lift. Its chief dimensions are:—

No. of machine.	Surface.	Surface of planes.	Surface of tail.	Weight.	Weight of rubber.	Area per sq. oz. of rubber.	Area per weight of model.	Weight per sq. ft.
14	sq. ins. 880	sq. ins. 780	sq. ins. 100	ozs. 20	ozs. 5 (about)	sq. ins. 156	sq. ins. 39	ozs. 3 $\frac{1}{2}$
	Span.	Chord.	Tail.	Rudder and fin.				
	4 ft. upper plane	9 $\frac{1}{2}$ ins.	14 x 7 ins.	30 sq. ins.				
	3 ft. lower plane	9 ins.						

One of my great difficulties has been to make the planes light and yet strong enough (the frame and chassis are fairly simple). My present system is as below:—



It is difficult to make and hard to keep straight, and, in fact, altogether not very satisfactory. I hope, however, to continue now that I am at home again.

#### American Records.

We have received the following from Mr. G. F. Forster (23, Euclid Avenue—Summit, New Jersey, U.S.A.):—

"I see in your issue for December 15th you seem to doubt that we fly our models according to the rules [no not according to any rules—because so far as I know there is no rule that model flying must be carried out on (approx.) level ground V.E.J.]. We do not fly our models from hills, towers, or any such elevated places, although the names of the places might give that impression. Oakwood Heights is the flying ground on an island in New York Bay.—It is there than man-carrying machines are flown. It is a reclaimed saltmarsh, and when the tide is high the water from the bay comes up in the ditches which drain the fields. It takes its name from the name of the railroad station, which is on higher ground about two miles from the field. Summit is the highest point in the country around here. It is a town on the top of a mountain. We fly our models on level ground near the Passaic River, about two and a-half miles from the town. If possible, I will send you photographs of the fields [We shall be very pleased to receive them]. I have not been able to obtain any yet. I trust I have cleared up all doubts."

Last year the proposed international competition fell through; we sincerely trust the same thing will not occur this year. It would be extremely interesting to see how some of the record-breaking American models would fly over here, where the meteorological conditions are decidedly different.

#### The Coming Show at Olympia.

The forthcoming model exhibition and competition at Olympia will now very soon be here, and it behoves all would-be exhibitors who have not as yet completed their machines to do so at the very earliest possible date; at the very last moment there is almost sure to be something that is wrong and that requires altering, or some little suddenly-thought-of or suggested improvement, which if driven off too long may make the particular "last moment" referred to above arrive too late to carry out the desired improvement. There is already every promise of the Show being a record one, at any rate so far as models are concerned, and we are certain that many who have decided not to exhibit will much regret it afterwards, both individuals and clubs. We shall not be at all surprised to see some quite new reputations made as the result of this exhibition—and some of those who have already won laurels must above all not think that anything but their very best original work will stand any chance of success. At present we are not permitted to particularise any further. There is

just one point to which we would refer, *i.e.*, the case in which competitors are making model hydro-aeroplanes and fitting them with both wheels and floats. The wheels should be so arranged that they can be drawn up out of the water, as on the Donnet-Leveque, Curtiss, &c. Personally we do not advise the combined model—in a class where the model actually has to fly we think it would be a mistake—a needless handicap. We make special mention of this because we recently heard that such models were actually being constructed.

#### Query.

Mr. P. Moss desires to know the best proportions for making rubber lubricants of (1) soft-soap and black-lead, (2) soft-soap and French chalk.

#### Replies in Brief.

**FLYING FOX.**—In reply to your first query, write to Mr. Stanger, 20, Brograve Road, Tottenham, N. Possibly he could devise something for you. Generally speaking, the flight is not, I am afraid, long enough to necessitate controlling. In reply to your second, presuming you mean a power-driven model about one-third distance from leading edge; but you must not take this as anything more than a rough approx.

**R. L. B. STEELE.**—Your statement is both interesting and curious, but, before expressing an opinion, we would like to know what happens when your model turns into the wind when flying. When launching it with the wind, do you launch it with sufficient velocity.

**J. H. MATKIN.**—You will, no doubt, find much useful information in January 11th issue (*vide* Mr. Temperley's query). There are, however, no hard and fast rules—so much depends on both the general design of the model and the workmanship—you do not state whether the model is to be hand-launched or to rise off the ground.

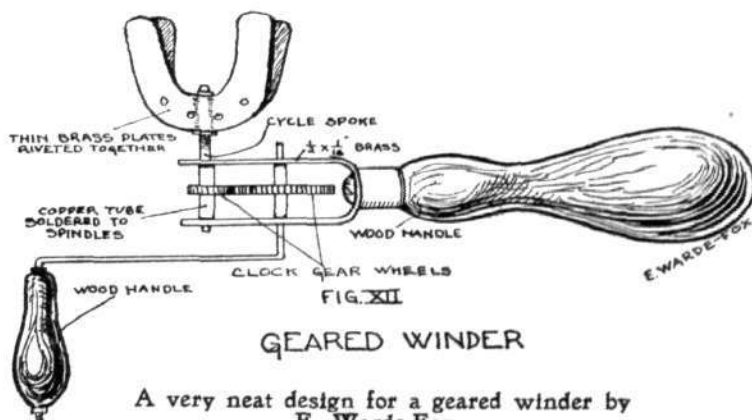
**L. THOMPSON.**—Is desirous of building a hydro-aeroplane—a biplane, with two rear floats and one front one, twin propellers, and wants the model to weigh complete with floats not more than six ozs., what size should he make the floats? The model alone he estimates should weigh about 4 ozs.

This last statement clearly shows that our correspondent is not aware of what has been written in this section on the subject during last year. To have floats weighing one-third the total weight of the model is absurd, they should not weigh more than one-twelfth.

To find out the size of floats required, their buoyancy should be sufficient to support at least one and a half times the weight of the model, if twice as much all the better, knowing the weight of a cubic ft. of water, 1,000 ozs., this is not difficult. They must be constructed of varnished silk stretched over a light skeleton framework of whitewood. The reason your former machine was unsuccessful was the floats were far too heavy.

**R. JAGO.**—Write to Mr. W. H. Akehurst, 27, Victory Road, Wimbledon, S.W., and later write us again *re* the matter.

**R. J. BENSON.**—The fabric is fastened on to the woodwork of the planes generally by means of good glue, &c.; sometimes it is sewn on as in the case of wire frames. Personally I always sew it on as it can easily be removed or re-tightened should it become slack. The successful covering of a wing, whichever method you adopt, requires both care, patience and practice. To tighten a fabric when slack you can of course use a dope, as advertised in these columns, which both tightens the fabric and renders it waterproof, &c. Care must be taken, however, to see that it is not put on an already taut fabric, or further tightening will almost certainly deform the wing.



FREEHAND Artists (rapid sketchers) required on editorial staff of FLIGHT for sketching machines and parts. Address "The Editor," 44, St. Martin's Lane, W.C.

## CORRESPONDENCE.

### The Kite and Model Aeroplane Association.

[1711] The recent growth of aviation has caused an ever-increasing amount of attention to be directed to the important scientific work and experiments that yet remain to be carried out in order to place the British aeronautical industry on a footing that will enable it to meet on level terms the industries that have been established abroad, and in many cases fostered directly by State subsidies.

In developing its industries, this country has always relied chiefly on private effort and endeavour. Expert opinion is unanimous in the view that scientific and technical progress can best be achieved by means of experiments with models. Model flying is by no means simply a sport or pastime; in many respects it has become a science, fraught with great possibilities for the development of the full-size machine for military and other purposes. Furthermore, it forms an educational medium of the very highest value.

It is on this basis that the Council of the Kite and Model Aeroplane Association ventures to appeal to your readers to join the membership of this body. If the model aeroplane is to receive the support and widespread recognition that are essential for the proper future development of aviation in this country, it is necessary that its governing body should be strengthened as far as possible.

The Kite and Model Aeroplane Association is recognised, by agreement with the Royal Aero Club, as the governing British body in all matters pertaining to kites and model aeroplanes. For the past three years the association has carried out, at considerable expense, a series of competitions that have done much to foster model aeroplaning in this country. For the coming year an international model competition, to be held in England this summer, is in process of organisation, in addition to a number of other national competitions.

Furthermore, the Association has recently succeeded, with the approval of the War Office, in forming a Motor Man-lifting Kite and Wireless Corps (the War Kite Squadron) to be run in conjunction with the Territorial Army. Donations to this patriotic object are urgently needed.

In order to pursue its work, which, as you will see, is in great part national in its nature, the Association appeals to all those who have the development of aeronautics at heart to join its membership and strengthen its hands and also give or obtain the gift of prizes.

A leaflet setting forth briefly the objects and activity of the Kite and Model Aeroplane Association, together with an application form for membership, will be forwarded on application to

W. H. AKEHURST, Hon Secretary,  
The Kite and Model Aeroplane Association.

27, Victory Road, Wimbledon.

### Collindale Avenue.

[1712] As an ardent motor cyclist and a lover of aviation I venture to ask you if you can tell me whether any of us will live to see Collindale Avenue repaired. For the past few months it has been in a perfectly abominable state, but yesterday it represented a perfect bog.

Crowds of jeering people stood at the corner of the road (?) to watch my friend and myself (both on motor cycles) ride towards the aerodrome, and it was only our contempt for their remarks which made us stick to our task.

I am unaware whose business it is to keep this road in proper condition, but when motor cyclists or even motorists coming to see the flying are confronted with such a horrible mess, it makes them think twice before they venture across it.

TEETEEST.

### The Collapse of Monoplane Wings.

[1713] I was very pleased to see Mr. Howard Flanders' reply to my remarks on the question of the collapse of monoplane wings, because, however much we may differ, it is by these very differences that good may result from the discussion.

Mr. Flanders' remarks, however, valuable as they undoubtedly are, lose much of their emphasis from the fact of his having missed the point of my argument, viz: that it is possible for the ends of the wings both to twist in the same direction and to be resisted in their twisting by the body portion of the machine. In the conditions assumed in my argument, one plane does not increase in angle while the other decreases in angle, and the attitude of the machine to the horizon has no relation to the question.

The suggested experiment of the stone placed on the passengers' seat, which would leave the seat on top-pressure occurring, has no bearing on the proposition, because the strains and breaking effect suggested in my article do not necessarily involve descent at all, prior to the actual collapse of the wings. I fully appreciate that

the upper bracing should not be slack, that the pilot has instruments, and that the maker braces the wings to guard against all the strains he can calculate or imagine, but without being a maker, designer or mathematician, one can still realise that there exists some force hitherto unrecognised, and consequently unguarded against, for in spite of all Mr. Flanders tells us, monoplane wings do occasionally collapse downwards. It is therefore the duty of all who are interested in aviation, to suggest any thought which, if not the whole reason or a full explanation, may prove a clue to this unexplained danger. Hence my temerity in offering a modicum to the theory of aviation.

GRIFFITH BREWER.

### PUBLICATIONS RECEIVED.

*Les Hydro-Aeroplanes.* By P. Riviere. Preface by A. Tellier. Paris: Librairie Aeronautique, 40, rue de Seine. Price 3 frs.

*A Catalogue of an Exhibition of Apparatus Illustrating the Application of Scientific Principles to Aeronautics.* Board of Education (Science Museum). London: Board of Education, Whitehall. Price 1d.

*List of the Works on Aeronautics in the Science Library.* The Science Museum, South Kensington. London: Board of Education, Whitehall. Price 4d.

### NEW COMPANY REGISTERED.

**A. V. Roe and Co., Ltd.**—Capital £30,000, in £1 shares (20,000 participating pref.). Acquiring the business of manufacturers of aeroplanes and accessories and general engineers carried on by E. A. V. Roe and H. V. Roe at Brownsfield Mills, Great Ancoats Street, Manchester, as A. V. Roe and Co.

### IMPORTS AND EXPORTS, 1911-12.

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910):—

	Imports.		Exports.		Re-Exportation	
	1911.	1912.	1911.	1912.	1911.	1912.
	£	£	£	£	£	£
January ...	1,196	619	1,088	2,412	Nil	Nil
February ...	3,129	3,110	1,786	36	Nil	Nil
March ...	11,327	640	1,027	950	357	600
April ...	2,110	4,820	807	72	4,343	50
May ...	1,707	7,494	2,471	1,350	1,972	154
June ...	3,225	7,928	2,432	419	1,682	300
July ...	9,822	13,794	2,256	5,376	643	967
August ...	2,873	8,559	2,153	1,342	265	2,040
September ...	1,839	6,575	1,183	2,885	—	1,626
October ...	4,727	6,836	701	3,128	400	695
November ...	1,785	8,455	1,440	2,002	360	405
December ...	690	11,290	1,129	1,824	—	3
12 months	44,430	80,120	18,480	21,796	10,022	6,840

### Aeronautical Patents Published.

Applied for in 1911.

Published January 23rd, 1913.

- 29,058. R. WELFORD. Aeroplanes.
- 29,268. S. H. MOWBRAY. Flying machines.
- 29,333. V. A. PALAEZ. Construction of aeroplanes.

Applied for in 1912.

Published January 23rd, 1913.

- 36. R. C. SAYER. Aerostats, &c.
- 1,324. S. M. WILLIAMS. Flying-machines.
- 25,939. H. MACK. Aeroplanes.

## FLIGHT.

44, ST. MARTIN'S LANE, LONDON, W.C.

Telegraphic address: Truditur, London. Telephone: 1828 Gerrard.

### SUBSCRIPTION RATES.

FLIGHT will be forwarded, post free, at the following rates:—

UNITED KINGDOM.			ABROAD.		
	s.	d.		s.	d.
3 Months, Post Free ...	3	9	3 Months, Post Free ...	5	0
6 " " " " " " " " " " " "	7	6	6 " " " " " " " " " " " "	10	0
12 " " " " " " " " " " " "	15	0	12 " " " " " " " " " " " "	20	0

Cheques and Post Office Orders should be made payable to the Proprietors of FLIGHT, 44, St. Martin's Lane, W.C., and crossed London County and Westminster Bank, otherwise no responsibility will be accepted.